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Jerry M. Conley, Director

FEDERAL AID IN FISH RESTORATION
1992 Job Performance Report
Project F-71-R-17

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS

Job No. 3 (NA)-a. Region 3 (Nampa) Mountain Lakes Investigations
Job No. 3 (NA)-b. Region 3 (Nampa) Lowland Lakes and Reservoirs Investigations
Job No. 3 (NA)-c. Region 3 (Nampa) Rivers and Streams Investigations
Job No. 3 (NA)-d. Region 3 (Nampa) Salmon and Steelhead Investigations
Job No. 3 (NA)-e. Region 3 (Nampa) Technical Guidance

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JOB PERFORMANCE REPORT

State of: Idaho

Name: Regional Fishery Management Investigations

Project No.: F-71-R-17

Title: Region 3 (Nampa) Mountain Lakes Investigation

Job No.: 3(NA)-a

Period Covered: July 1, 1992 to June 30, 1993

ABSTRACT

No formal sampling was conducted by regional personnel at mountain lakes in 1992.

Forty-seven alpine lakes were stocked in 1992. Westslope cutthroat trout Oncorhynchus clarki lewisi fingerlings accounted for 89% of stocking, with rainbow trout O. mykiss stocked in four lakes and artic grayling Thymallus arcticus in one lake.

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OBJECTIVE

To collect information for fishery management decisions regarding alpine lakes and their ecosystems.

INTRODUCTION

Mountain lake management activities consist of a 2- or 3-year rotational stocking program. Information on individual lakes is gathered from anglers and limited lake visits by regional staff. Most lakes are stocked by the McCall Hatchery via airplane.

RESULTS

Forty-seven mountain lakes were stocked in Region 3 in 1992. Westslope cutthroat trout Oncorhynchus clarki lewisi were stocked in 42 lakes, rainbow trout O. mykiss in 4 lakes, and artic grayling Thymallus, arcticus in 1 lake (Table 1).

RECOMMENDATIONS

1. Survey fish populations in two separate mountain basins as to diversity, fish species presence or absence, angler use, and basic water quality. A Payette River drainage and Boise River drainage basin will be investigated in 1993.

2. Reassess rotational stocking program success with data collected from the basin survey.

3. Develop a complete set of Loran coordinates for all Region 3 mountain lakes.

Table 1. Summary of mountain lakes stocked in 1992.

Lake	Drainage and IDFG lake number	Location (R,T, S)	Species	Number Stocke
Tra Creek #3	09-0141	10N12E29	C2	500
Bar #4	09-0149	9N12E26	C2	1,000
Bea #2	09-0160	9N12E34	C2	500
Nor Fork Baro Creek #1	09-0142	1ON12E34	C2	500
Nor Fork Baro Creek #2	09-0143	10N12E25	C2	750
Nor Fork Baro Creek #3	09-0144	10N12E35	C2	500
Nor Fork Baro Creek #4	09-0145	10N12E35	C2	500
Pinchot Lake	09-0179	8N12E19	C2	500
Fall Creek#1	09-0185	8N12E29	C2	500
Fall Creek#2	09-0186	8N12E32	C2	500
Fall Creek#3	09-0187	8N12E32	GR	900
Everlv Lake	09-0200	7N12E8	C2	1.000
Three-Island Lake	09-0198	7N12E9	C2	500
Robert Jackson Lake	09-0195	7N12E10	C2	1.000
Ten Lake #4	09-0214	7N12E12	C2	500
Ten Lake #5	09-0215	7N12E12	C2	500
Ten Lake #6	09-0216	7N12E12	C2	500
Ten Lake #7	09-0217	7N12E12	C2	500
Ten Lake #8	09-0218	7N12E12	C2	500
Ten Lake #9	09-0219	7N12E12	C2	500
Ten Lake #10	09-0220	7N12E12	R9	500
Ardeth Lake	09-0211	7N12E1	C2	1.000
Helen Lake	09-0209	8N12E35	C2	500
Vernon Lake	09-0243	7N12E12	C2	1,000
Eight Mile #1	09-0125	10N9E29	C2	1,500
Red Mtn. #3	09-0124	11N9E33	C2	1.500
Red Mtn. #2	09-0123	11N9E33	C2	1,500
Cat Creek #6	09-0133A	11B9E28	C2	500
Cat Creek #5	09-0133	11N9E28	C2	1.500
Cat Creek #4	09-0132	11N9E21	C2	1,500
Cat Creek #3	09-0131	11N9E28	C2	1.000
Cat Creek #2	09-0130	11N9E28	C2	1.000
Lake Creek Lake	10-0202	5N10E17	C2	500
Lynx Creek #1	10-0264	6N12E19	C2	1,000
Misfire #3	10-0271	6N12E7	R9	500
Nahneke Lake	10-0216	6N11E3	C2	500
Flat Top #1	10-0212	7N11E26	C2	500
Johnson Lake	10-0334	7N11E14	C2	1,000
Snow Bank Lake	10-0252	7N11E13	C2	750
Blue Jay Lake	10-0242	7N12E19	R9	500
Dandv Lake	10-0273	7N12E29	C2	1,000
Ingeborg Lake	10-0306	7N12E15	C2	1,000
Arrowhead Lake	10-0316	7NllEl	C2	1,000
Buck Lake	10-0000	8N10E36	R9	500
Trailer Lake	09-0141A	10N12E28	C2	500
Regan Lake	09-0141B	1ON12E28	C2	500
Sulfur Creek Pond	07-01071	14N9E21	C2	680

Drainage	Species	Total Stocked
07 = Salmon River	C2 = Westslope cutthroat trout	C2 = 32,680
09 = Payette River	R9 = Hayspur rainbow trout	R9 = 2,000
10 = Boise River	GR = Arctic grayling	GR = 900

JOB PERFORMANCE REPORT

State of: Idaho

Name: Regional Fishery Management Investigations

Project No.: F-71-R-17,

Title: Region 3 (Nampa) Lowland Lakes and Reservoirs Investigations

Job No.: 3(NA)-b

Period Covered: July 1, 1992 to June 30, 1993

ABSTRACT

Brownlee Reservoir

A total of 368 smallmouth bass Micropterus dolomieu were sampled at three established electrofishing transects. The bass mean length was 204.4 mm, over 60 mm less than the 1991 sample. The relative weight index was also considerably lower in 1992 than in 1991.

Bull Trout Lake

Spring gill net sets captured 55 brook trout Salvelinus fontinalis with a mean length of 189.2 mm. Six Atlantic salmon Salmo salar with a mean length of 235.8 mm were also captured.

C.J. **Strike Reservoir**

A .year-long creel survey interviewed 4,305 anglers that fished an estimated 238,346 hours for an overall 78.5 h/hectare pressure on the reservoir. An estimated 231,627 fish were caught with an estimated 72,630 fish harvested. Yellow perch Perca flavescens, rainbow trout Oncorhynchus mykiss, bluegill Lepomis macrochirus, and smallmouth bass were the most numerous in the harvest, respectively. Spring-planted (204 mm) rainbow trout returned to the angler at 22.9%; a significantly better return rate ($p<0.0001$) than a group of 140 mm late fall-planted trout that returned at 1.3%. The estimated cost of each returned fish was $0.67/fish for the spring-planted trout versus $7.35/fish for the fall-planted fish.

Deadwood Reservoir

The size of spawning kokanee O. nerka kennerlyi and the size of fall gill net sampled kokanee declined from 1991. The 1992 spawning run was probably the most numerous since the reservoir was treated. The reservoir did not fill in 1992, and additional water was released to leave the pool below the 50,000 acre-feet minimum pool requested.

Crane Falls Lake

Quarterly operation of the Crane Falls pump maintained acceptable water quality for trout survival in 1992. Largemouth bass M. salmoides mean total length was 265 mm with a relative weight of 98.2.

Rotenone Renovations

Star Lane Ponds and Indian Creek Reservoir were successfully renovated in 1992. Rotenone treatment removed a nongame fish population from Star Lane Ponds and a stunted crappie Pomoxis SR. population from Indian Creek Reservoir.

Drought Impacts

Lake Lowell, Paddock Reservoir, Succor Reservoir, Mountain Home Reservoir, Indian Creek Reservoir, Arrowrock Reservoir, and Lucky Peak Reservoir were all affected by the continuing drought. Restocking these affected waters will be a high priority when adequate water is available.

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OBJECTIVE

To gather biological data for management of Region 3 lowland lakes and reservoirs.

METHODS

Electrofishing sampling was conducted by utilizing either a Smith-Root SR-16 electrofishing boat or Coffelt VVP-2E pulsator with a hand-held probe. Experimental gill nets were floating or sinking type with six panels composed of 3/4-in, 1-in, 1 1/4-in, 1 1/2-in, 2-in, and 2 1/2-in mesh 150 feet in length. Trap nets were composed of two 3-ft x 6-ft frames with 3/4-in bar mesh with a 75-ft lead.

A creel survey on C.J. Strike Reservoir was conducted as a stratified random design, with the reservoir divided into three sections (strata), and random pressure counts conducted once per sampling day on each section (Figure 1). The same number of weekdays and weekend days were sampled. Creel clerks had predefined time intervals to conduct instantaneous angler pressure counts. Most instantaneous pressure counts were conducted via boat unless weather or ice cover prohibited safe boat operation. Clerks conducted angler interviews randomly interviewing anglers as encountered. Anglers were asked the length of time fished and number and species of fish harvested or released. Clerks questioned anglers as to the target species the angler was fishing for on this particular trip. Anglers were also questioned as to their residence zip code to allow an estimate of origin of residence and percentage of nonresident anglers. Clerks recorded whether the anglers fished from boats, bank, float tube, or ice. Completed or noncompleted trips were recorded.

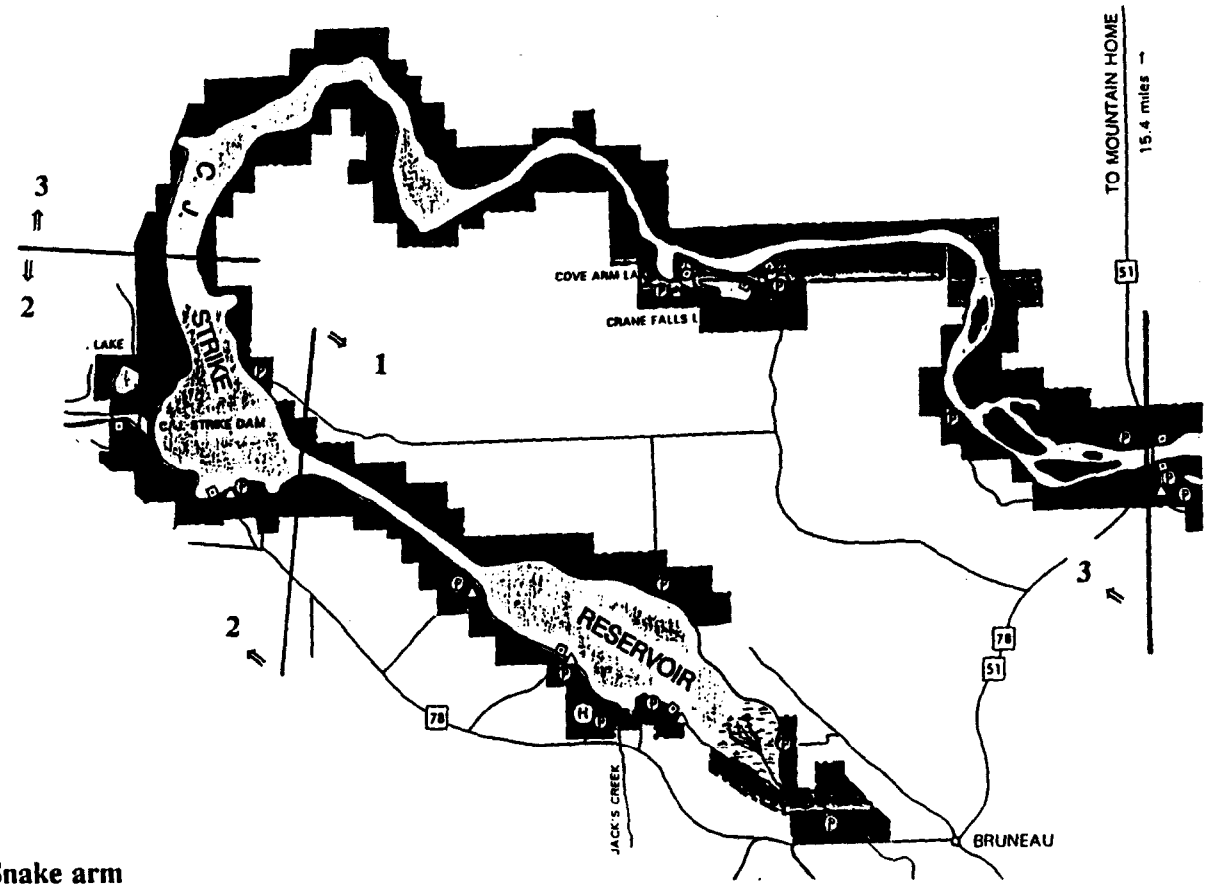
RESULTS

Brownlee Reservoir

A joint electrofishing project with Oregon Department of Fish and Wildlife (ODFW) sampled established electrofishing transects on the night of May 7, 1992. A total of 368 smallmouth bass Micropterus dolomieu were collected on three transects by Idaho Department of Fish and Game (IDFG) personnel compared to 560 in 1991. The smallmouth bass average total length was 204.4 mm and relative weight (Wr) of all sizes sampled was below 100 (Table 1). The 1991 sample documented mean Wr above 100 for all length ranges. The mean sample length decreased in 1992 from 1991 (Figure 2). Electrofishing did not sample the larger fish effectively. The length frequency of bass weighed in at a 1992 bass tournament documents the relative size distribution of older fish not captured by electrofishing (Figure 3).

IDFG personnel assisted ODFW personnel tag legal length, 305 mm and larger, smallmouth bass at three bass tournaments in March and April, 1992. Approximately 1,200 bass were tagged with Floy or Carlin type tags. Population estimates for the legal-sized fish in the reservoir were estimated at 119,024, with a 95% confidence interval of 50,654 to 187,394. No advertising or rewards were offered for return of tags, thus resulting in only minimal tag returns.

Study Area



3 = Snake arm
2 = Dam
1 = Bruneau arm

Figure 1. Creel survey study area for C.J. Strike Reservoir for the period March 16, 1992 to March 14, 1993.

Table 1. Mean relative weight (Wr) of smallmouth bass sampled by electrofishing three transects on Brownlee Reservoir on the night of May 7, 1992.

Length group (mm)	Number	Mean relative weight (Wr)
101-150	11	-
151-200	96	-
201-250	61	85.1
251-300	72	87.6
301-350	15	94.5

BROWNLEE RESERVOIR
SMALLMOUTH BASS LENGTH FREQ.
ELECTROFISHING

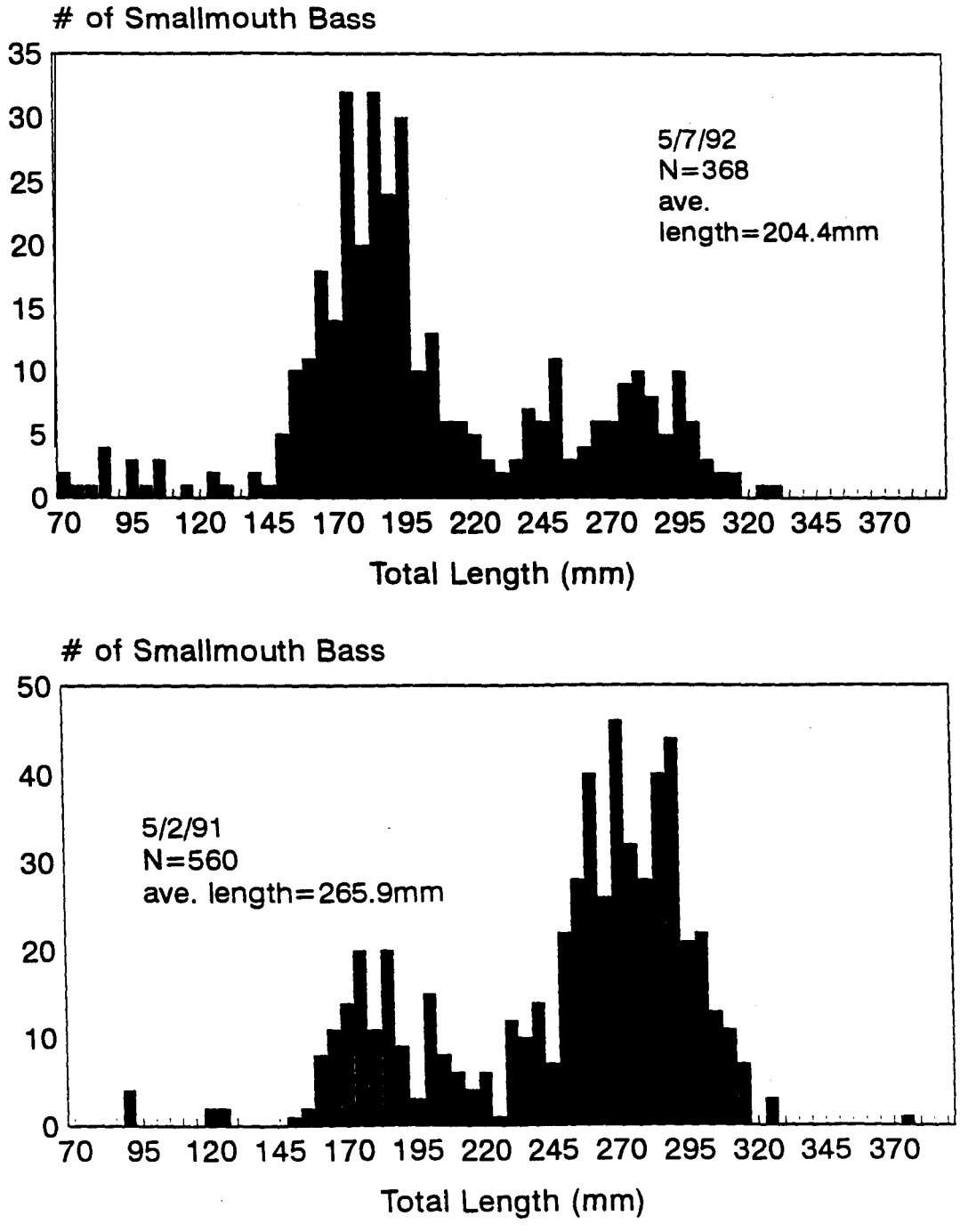


Figure 2. Brownlee Reservoir smallmouth bass electrofishing length frequency data for 1991 and 1992.

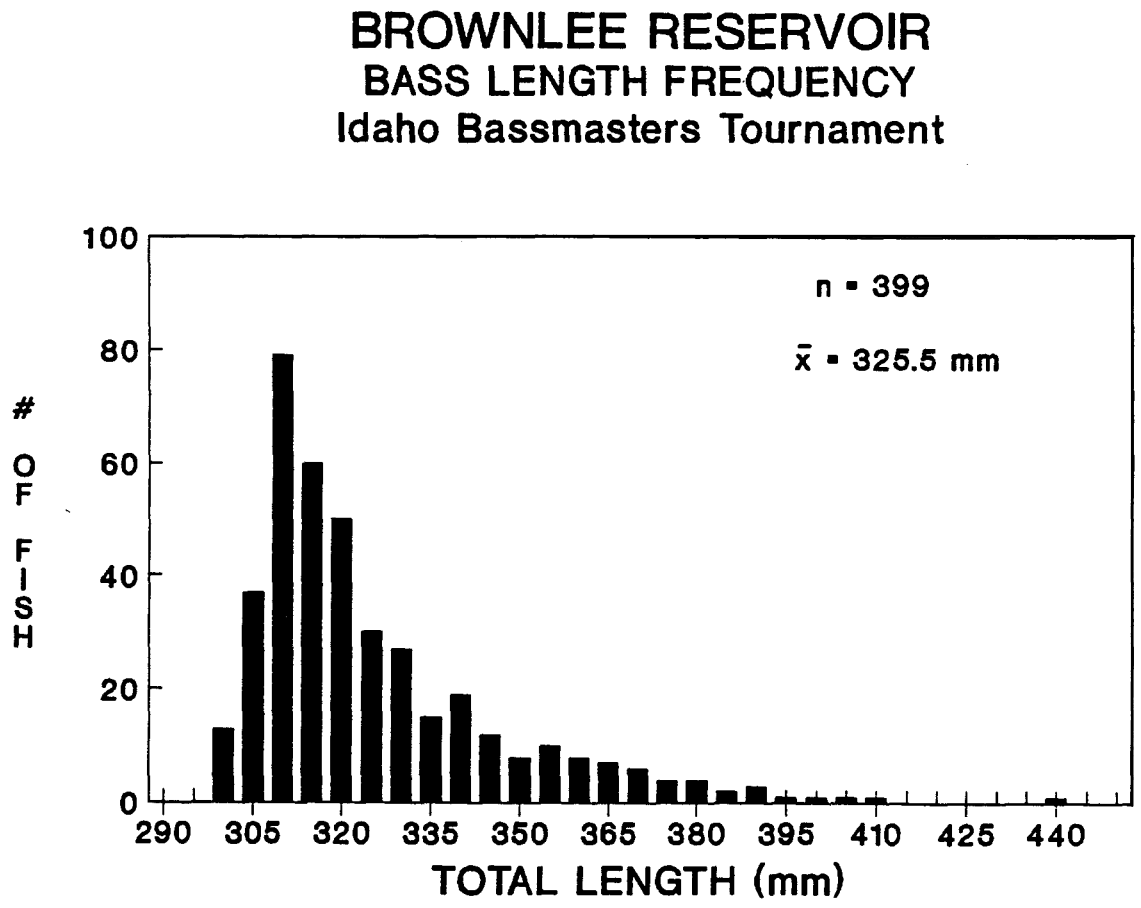


Figure 3. Brownlee Reservoir smallmouth bass length frequency of legal length bass from Idaho Bassmasters Tournament, March 1992.

Bull Trout Lake

Bull Trout Lake was sampled with four 150-ft gill nets set overnight in June 1992. Six Atlantic salmon Salmo salar with a mean length of 236 mm were captured. Atlantic salmon stocked in Deadwood Reservoir the same year Bull Trout Lake was stocked had an average length of 457 mm. Atlantic salmon have not successfully utilized the stunted brook trout Salvelinus fontinalis for forage. Fifty-five brook trout with a mean length of 189 mm were also captured. The brook trout length ranged from 150 to 270 mm in total length (Figure 4). The brook trout sample length range was essentially the same as the October 1991 sample. The number of fish in the 1992 sample was much lower than the numbers sampled in 1991; different sampling gear was used between years.

C.J. Strike Reservoir

A creel survey was conducted on C.J. Strike Reservoir from March 16, 1992 through March 14, 1993 to estimate the effort, catch, and contribution of the various species of fish and fingerling rainbow trout Oncorhynchus mykiss to the fishery.

Creel clerks interviewed 2,001 angling parties with an average party size of 2.2 anglers for a total interview of 4,305 anglers. Ninety-six percent were Idaho residents, with the majority from Ada County and the Mountain Home Air Force Base (Table 2). Average completed fishing trip length was 3.8 hours. The majority of anglers utilized boats while fishing the reservoir (Figure 5).

Anglers' species preference shifted by season (Figure 6). Smallmouth bass was the preferred species, followed by rainbow trout for the spring and fall seasons. Rainbow trout was the species of preference in the fall and winter.

Anglers fished an estimated 238,346 (±14,238) hours (78.5 h/hectare, 194 h/acre). Boat anglers exerted 48.1 (±3.1) h/hectare pressure and bank anglers 27.9 (±3.4) h/hectare average effort. Brownlee Reservoir and Lucky Peak Reservoir pressure estimates were approximately twice the pressure per hectare as C.J. Strike Reservoir at 140.3 and 140.9 h/hectare, respectively. Fishing effort on C.J. Strike Reservoir was highest in the months of March, May, and July (Table 3).

An estimated 231,627 (±25,303) fish were caught during the year-long creel period (Table 3). An estimated 72,630 fish, or 31.4% of the total catch, were harvested (kept). The percentage of anglers keeping or releasing a specific number of fish is given in Figure 7. Major species contributing to the harvest were yellow perch Perca flavescens, rainbow trout, bluegill Lepomis macrochirus, and smallmouth bass, respectively (Figure 8). The average overall catch rate was 0.88 fish/h, with the summer months having the highest catch rates (Table 3). Harvest estimates for individual species are presented in Table 4. Catch rates for anglers fishing for a targeted species are presented in Table 5. Catch rates for anglers fishing for a specific fish species may be a better reflection of angler success. The bluegill total catch rate was highest at 1.82 fish/h, smallmouth bass catch rate was 1.0 fish/h, and rainbow trout catch rate was 0.38 fish/h (Table 5).

During the creel survey, the clerks looked for two groups of marked rainbow trout. Kamloop/steelhead (KS) were stocked on December 16, 1991 at 140 mm average length (Falls), and unspecified origin rainbow (RI) were stocked on March 25, 1992 at a 203 mm average length (Springs). The two groups returned to the angler harvest at significantly different rates (Fisher Exact Test $p<.0001$). The Springs group was harvested at an estimated 22.9% return rate. The Fall group of 140 mm trout were harvested at an estimated 1.3% return rate. Seven recaptured fish were removed from the analysis because of probable

BULL TROUT LAKE
BROOK TROUT LENGTH FREQUENCY
June 1, 1992

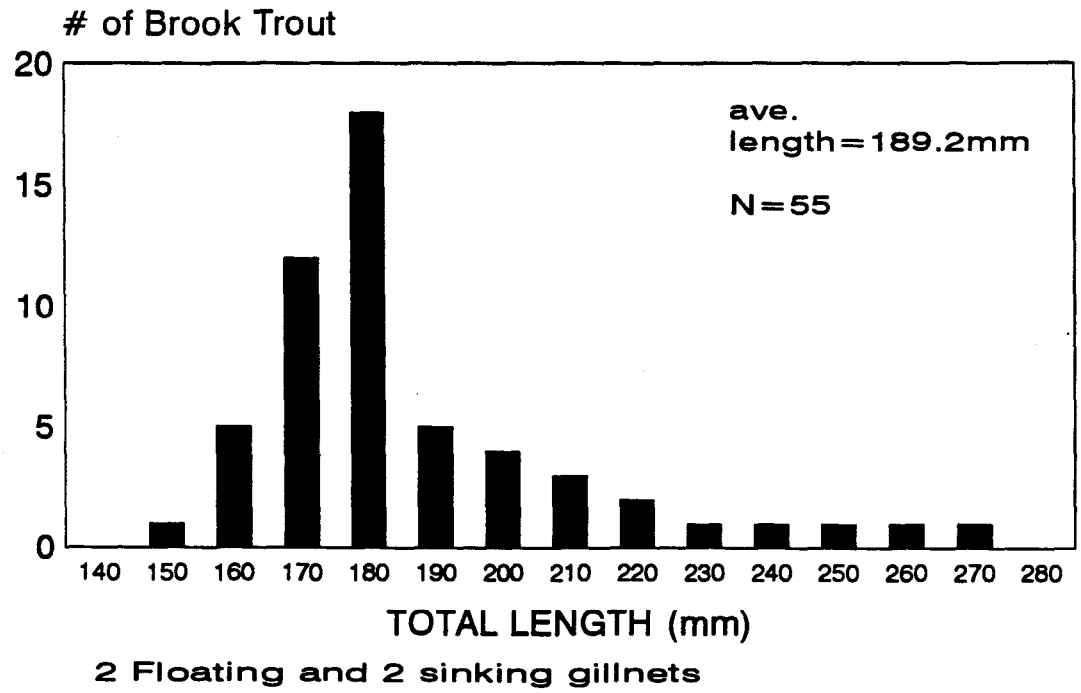


Figure 4. Bull Trout Lake brook trout length frequency of gill net sampled fish, June 1992.

Table 2. County of residence of Idaho anglers fishing C. J. Strike from March 16, 1992 to March 14, 1993.

County of Residence	Percent of Resident Anglers[a]
Ada	35.1
Mountain Home Air Force Base	26.6
Canyon	13.8
Owyhee	6.4
Elmore	4.2
Twin Falls	4.4
Gooding	2.2
Minidoka	1.5
Cassia	1.3
Blaine	1.1
Jerome	1.0
17 other counties	2.4

[a] Four percent of total anglers were non-residents.

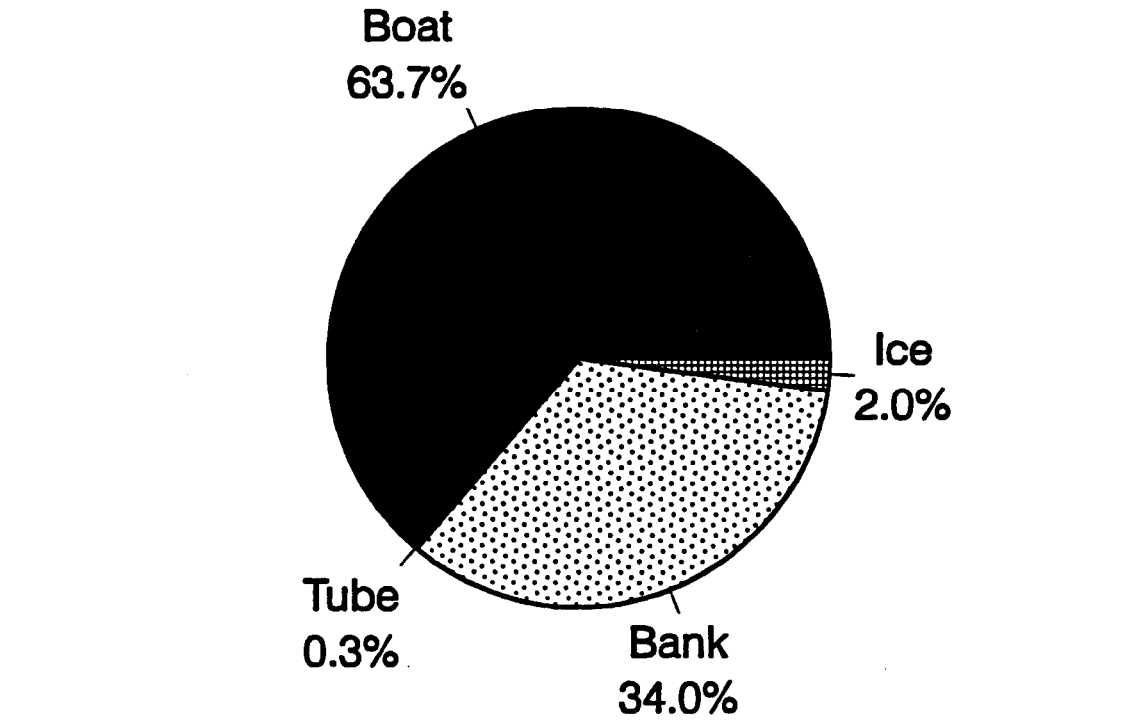
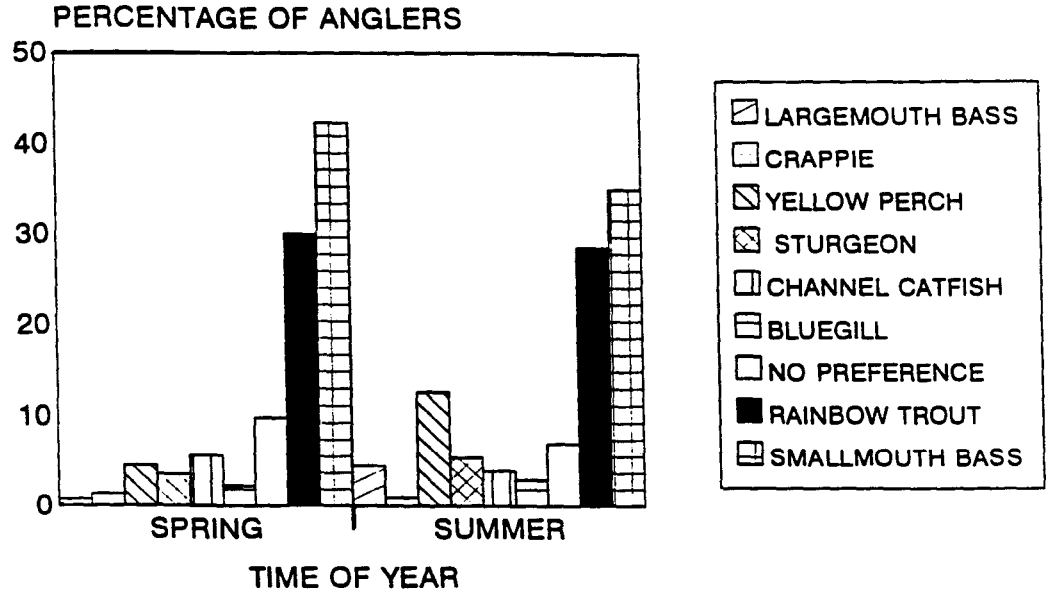
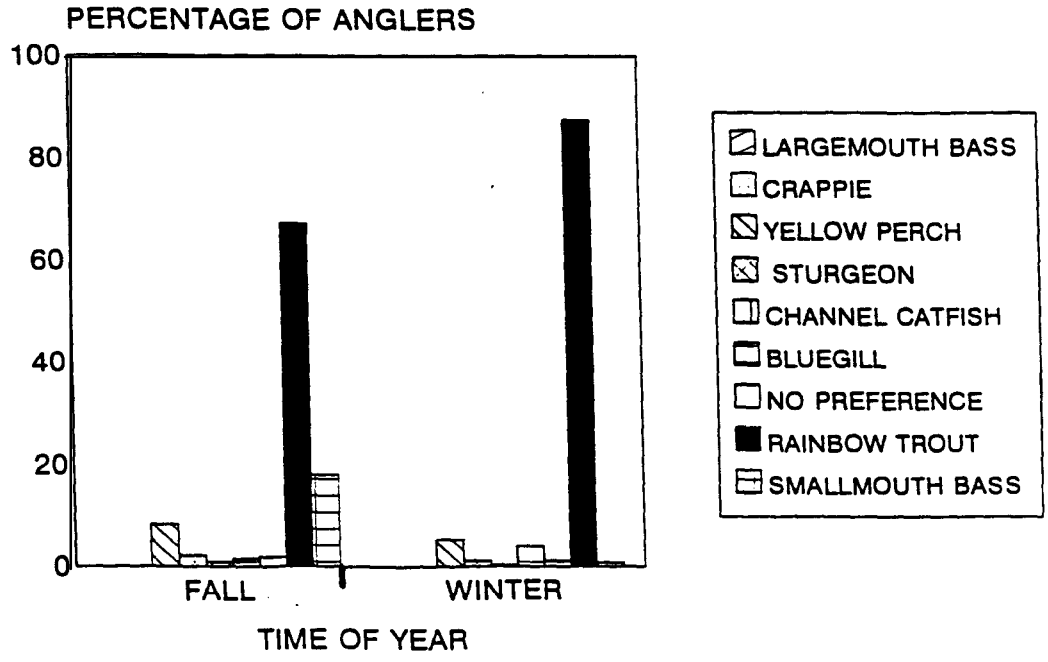


Figure 5. Percentage of anglers either fishing from boats, bank, ice, or float tubes at C.J. Strike Reservoir from March 1, 1992 to March 14, 1993. Values indicate percent of total anglers observed in instantaneous counts.

SPECIES PREFERENCE BY SEASON



Spring 3/22/92 to 6/7/92
Summer 6/21/92 to 9/26/92



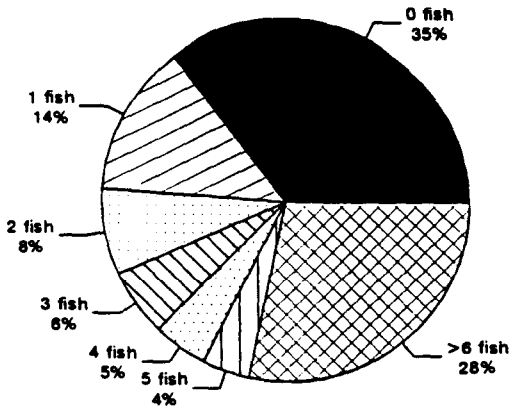
Fall 9/30/92 to 12/20/92
Winter 12/26/92 to 3/14/92

Figure 6. Seasonal angler species preference for C.J. Strike Reservoir from March 16, 1992 to March 14, 1993.

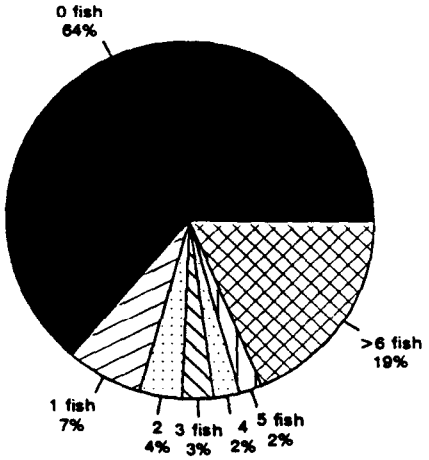
Table 3. Estimated effort, catch rate, and total catch by sample intervals for C.J. Strike Reservoir from March 16, 1992 to March 14, 1993.

Interval	Effort (h)	+95% CI	Catch Rate (fish/h)	Total Catch[a] (number)	+95% CI
Mar 16 - Apr 12	28,180	(4,880)	0.73	21532	(7,893)
Mar 13 - May 10	15,699	(3,363)	0.78	14008	(9,809)
May 11 - Jun 7	27,690	(8,016)	0.35	9536	(5,005)
Jun 8 - Jul 5	24,606	(6,130)	0.98	24225	(14,380)
Jul 6 - Aug 2	27,110	(6,536)	1.95	54944	(25,818)
Aug 3 - Aug 30	24,281	(6,223)	1.52	37,953	(15,581)
Aug 31 - Sep 27	25,423	(4,212)	1.55	38,869	(14,616)
Sep 28 - Oct 25	25,222	(11,982)	0.51	10,655	(6,334)
Oct 26 - Nov 22	5,374	(1,741)	0.42	2,016	(1,236)
Nov 23 - Dec 20	3,485	(1,186)	0.59	2,316	(2,270)
Dec 21 - Jan 17	6,329	(3,229)	0.77	4,817	(3,494)
Jan 18 - Feb 14	14,325	(8,284)	0.65	7,339	(6,936)
Feb 15 - Mar 14	10,622	(6,360)	0.31	3,417	(3,638)
Totals	238,346	(14,283)	0.88	231,627	(25,303)

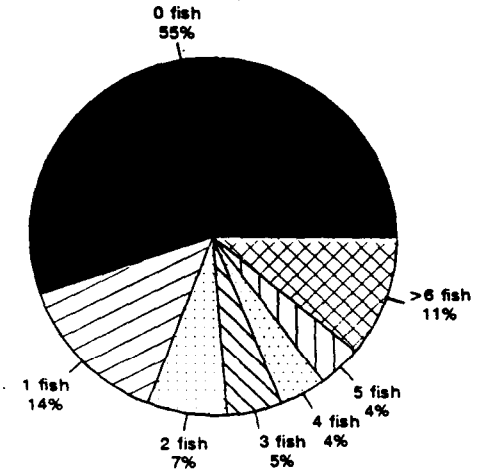
[a] Only game fish were included in this summary.



Percentage of anglers catching the indicated number of fish



Percentage of anglers releasing the indicated number of fish



Percentage of anglers harvesting the indicated number of fish

Figure 7. Percentage of anglers catching, releasing, or harvesting an indicated number of fish at C.J. Strike Reservoir from March 16, 1992 to March 14, 1993.

C.J. STRIKE HARVEST COMPOSITION

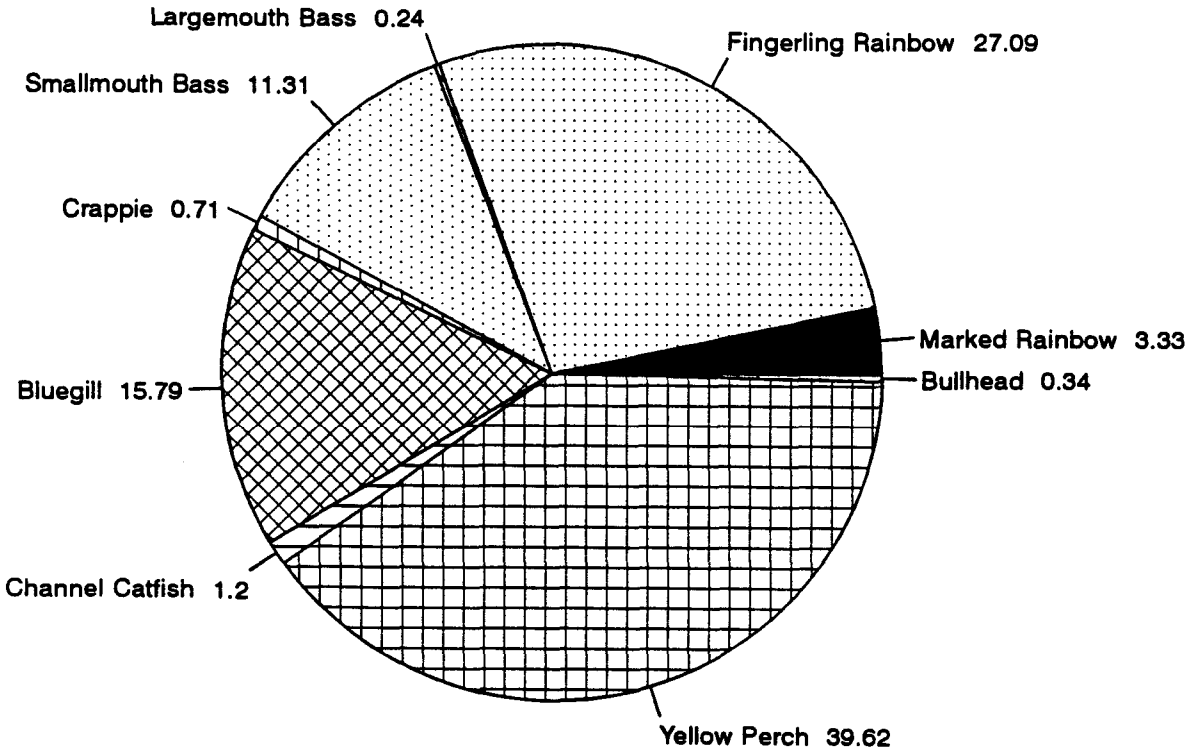


Figure 8. Harvest composition percentages of different species for C.J. Strike Reservoir from March 16, 1992 to March 14, 1993. Values represent percentage of total harvest.

Table 4. Total harvest for game fish species (95% confidence interval in parenthesis) by creel census interval for C.J. Strike Reservoir from March 16, 1992 to March 14, 1993.

Interval	Rainbow trout	Fin-clipped fingerling rainbow	Smallmouth bass	Yellow perch	Channel catfish	Bluegill	Largemouth bass	Crappie
3/16 - 4/12	638 (820)	0 (0)	747 (596)	630 (804)	77 (112)	358 (488)	39 (54)	199 (238)
4/13 - 5/10	1,786 (1,614)	62 (84)	276 (390)	205 (367)	20 (41)	1,852 (2,298)	0 (0)	97 (138)
5/11 6/7	1,216 (908)	0 (0)	267 (303)	427 (537)	223 (214)	649 (1,305)	21 (24)	269 (535)
6/8 7/5	2,771 (2,688)	377 (343)	1,260 (1,396)	658 (633)	175 (293)	540 (988)	64 (128)	64 (128)
7/6 8/2	1,287 (1,379)	89 (126)	2,168 (1,298)	5,531 (4,738)	320 (577)	944 (1,803)	62 (129)	17 (35)
8/3 8/30	1,607 (1,098)	126 (141)	1,242 (861)	1,668 (1,644)	474 (830)	1,607 (1,971)	11 (4)	0 CO)
8/31 9/27	1,512 (865)	161 (224)	1,067 (1,004)	11,906 (6,464)	19 (40)	4,024 (4,477)	0 (0)	0 CO)
9/28 10/24	2,432 (2,282)	417 (537)	1,653 (1,388)	3,185 (3,510)	0 (0)	16 (36)	0 (0)	0 CO)
10/26 - 11/22	1,047 (763)	292 (236)	0 (0)	76 (107)	0 (0)	0 (0)	0 (0)	0 (0)
11/23 - 12/10	665 (705)	165 (151)	0 (0)	0 (0)	0 (0)	458 (583)	0 (0)	22 (49)
12/21 - 1/17/93	1,041 (806)	198 (176)	0 (0)	622 (755)	0 (0)	1,245 (1,448)	22 (32)	0 (0)
1/18 - 2/14/93	963 (874)	100 (118)	1,801 (2,049)	18 (39)	0 (0)	740 (1,087)	0 (0)	0 (0)
2/15 - 3/14/93	1,932 (1,758)	159 (175)	0 (0)	36 (86)	0 (0)	431 (805)	0 (0)	0 (0)
Total	18,897 (1,650)	2,146 (2,311)	8,881 (7,236)	26,745 (21,694)	1,326 (2,146)	12,864 (17,289)	219 (371)	668 (1,123)

Table 5. Comparison of catch rates of species by anglers targeting that particular species in C.J. Strike Reservoir from March 16, 1992 to March 14, 1993.

Species	Catch rate by species[a]		
	Catch Rate Kept	Catch Rate Released	Total
Smallmouth bass	0.07	0.93	1.00
Rainbow trout	0.28	0.10	0.38
Yellow perch	0.42	0.10	0.57
Bluegill	1.04	0.78	1.82
Sturgeon	0.00	0.02	0.02
Crappie	<.01	<.O1	<.O1
Channel catfish	<.01	<.01	<.01
Bullhead catfish	<.01	<.O1	<.01
Largemouth bass	<.01	<.01	<.01

[a] Average seasonal catch rates (fish/h) from sections 1, 2, and 3 combined.

misidentification of their marks; their size at harvest was very large for recently stocked fingerlings. Fin erosion from hatchery raceways affected both marked groups. In the future, the adipose fin should also be clipped to help with positive identification of marks. Length at harvest and growth rates were similar (Figure 9).

We recommend that spring-planted fish at least 200 mm total length should be utilized in C.J. Strike Reservoir in the future. These larger fish would be more economical because of the greater return to the angler. In this study, the spring-planted large-sized fish (R1) returned well; the late fall smaller 140 mm fish (KS) returned poorly. The spring-planted fish cost approximately $0.67 per fish returned, and the fall-planted fish cost approximately $7.35 per returned fish. A cost of production of $0.016 per inch per fish and a $200.00 cost per transported load were utilized in this estimate (Tom Frew, Hagerman Hatchery, personal communication). With available information, we cannot estimate how much of the difference in return rate is attributable to differences in size at stocking, time of stocking, or strain.

Yield Estimation

Estimates for yield per hectare of smallmouth bass (over 12 inches) and rainbow trout were calculated by creating length and weight frequencies for rainbow trout from creel survey data. Smallmouth bass weights from electrofishing data were applied to the length frequency from the creel data.

Yield estimates were 4.05 kg/hectare for rainbow trout and 1.43 kg/hectare for smallmouth bass. Other local waters have slightly lower yields, but are also less productive; Anderson Ranch Reservoir had an estimated 1.6 kg/hectare yield for rainbow trout and Arrowrock Reservoir was estimated at 1.1 kg/hectare. C.J. Strike Reservoir may also be comparable to Cascade Reservoir, which has had two rainbow trout yields calculated; 0.9 kg/hectare and 8.2 kg/hectare (Rob Dillinger, Idaho Department of Fish and Game, personal communication). In general, trout fishing in C.J. Strike Reservoir was poor during the creel survey. The angling public expressed their concern and commented frequently about the abnormally poor trout year. The poor return of the (Fall) stocked fingerling rainbow trout may have been a factor in the "poor trout year" and reduced the trout yield.

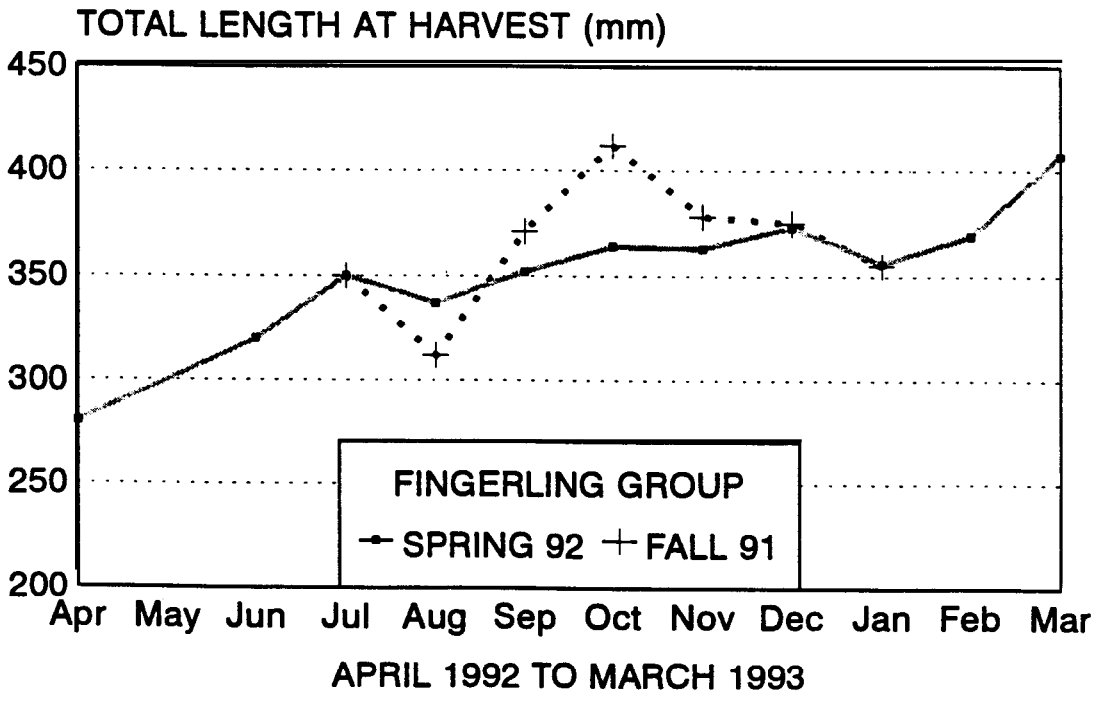
C.J. Strike Pond Rearing Program

Four culture ponds at Cottonwood Access were utilized for rearing white crappie Pomoxis annularis and channel catfish Ictalurus punctatus in 1992. An estimated 15,000 white crappie were raised and released into C.J. Strike Reservoir. Attempts at raising channel catfish were unsuccessful. Largemouth bass M. salmoides and white crappie will be reared and released in 1993. In previous years, largemouth bass have been successfully reared in the ponds.

C.J. Strike Supplemental Largemouth Bass Stocking Evaluation

In 1991, regional staff implemented an experimental supplemental stocking of largemouth bass into C.J. Strike Reservoir in an effort to increase the reservoir bass population. The sublegal and legal length largemouth bass were marked with a jaw clip, either a right or left maxillary bone was shortened by clipping with a pair of cutters. All recordable costs were tracked to provide an estimated cost of stocking individual fish and the cost of angler caught or harvested largemouth bass. Marked largemouth bass were monitored during a year-long creel survey from March 1992 through February 1993. Six bass tournament

MEAN LENGTH AT HARVEST FOR 2 FINGERLING RAINBOW TROUT GROUPS
AT CJ STRIKE RESERVOIR APRIL 1992 TO MARCH 1993



SPRING 92 FING. STOCKED 3/25/92 at 203 mm
FALL 91 FING. STOCKED 12/16/91 at 140 mm

Figure 9. Mean length at harvest for two marked rainbow trout fingerling groups at C.J. Strike Reservoir from March 16, 1992 to March 14, 1993.

weigh-ins were monitored in 1992, and all largemouth bass were examined during the tournament weigh-in for the presence of marks. Marked largemouth bass were also identified during the lowland lake fisheries survey conducted in May 1993. The three data sets identified above were used to generate independent cost estimates of a captured marked largemouth bass.

A total of 1,064 marked largemouth bass were transferred to the reservoir in the spring of 1991. The project utilized 67.5 regional man hours, 565 vehicle miles, and 12.5 hours of boat electrofishing. A project cost of $1,325 was calculated by adding the wages and benefits multiplied by the hours worked of each individual, vehicle miles by $0.26 per mile, and $25 per hour for use of the electrofishing boat. No overhead costs were included in this estimate. Each stocked largemouth bass cost $1.25 in direct cost.

A total of 23 largemouth bass were directly observed during the creel survey interviews. One largemouth bass was observed that had been marked (4.3%). Angler interviews documented 108 largemouth bass that anglers stated had been released during the creel survey period. The creel survey estimated that 219 (±176, 0.95 C.I.) largemouth bass were harvested; multiplying 219 by a 4.3% mark ratio estimates that 9.4 marked largemouth bass would have been harvested during the year. The estimated cost of each harvested largemouth bass was $140.95. The estimated cost of a released largemouth bass was $29.97, calculated using the above percentage occurrence of marks. The estimated cost of a marked largemouth bass caught by an angler (includes both harvested and released largemouth bass) was $24.72.

Six bass tournaments were monitored for marked largemouth bass between April and October 1992. A total of 45 largemouth bass were weighed in, 17 largemouth bass were marked (37.8%). The estimated cost of the return to the angler was $77.94 per marked legal-sized (>305 mm) largemouth bass. Note that all of the fish stocked were not of legal size by this time. The tournament rules also allowed culling of smaller fish, but this was most likely insignificant. All fish were released after weigh-in.

In May 1993, a lowland lakes fisheries survey documented 8 of 39 (20.5%) largemouth bass captured were marked. Sub-legal (<305 mm) marked largemouth bass were 13.3% of the sample, and larger marked largemouth bass were 25% of the sample. The calculated cost of marked largemouth bass captured in this sample was $165.63 each. It does appear that there has been good survival of the stocked largemouth bass.

In summary, the supplementally stocked largemouth bass were estimated to cost $1.25 in direct costs. The estimated cost of an angler caught largemouth bass varied; from $77.94 for a tournament weigh-in largemouth bass to $140.95 for a harvested largemouth bass and $29.97 for a released largemouth bass. The estimated cost per marked largemouth bass captured during a 1993 fishery survey was $165.63 two years after the supplemental stocking. For perspective, the two fingerling trout plantings evaluated with the creel survey returned to the angler at a cost of $0.67 and $7.35 per fish. The $1.25 cost per largemouth bass stocked should also be compared with the cost of $0.50 to $0.60 for a catchable trout to be stocked in C.J. Strike Reservoir. Probably the most expensive aspect of this supplemental largemouth bass stocking was the 67.5 man-hours of regional fish management time spent collecting the fish.

The cost of supplementing existing largemouth bass populations in C.J. Strike Reservoir was high considering the number of marked fish anglers captured. Also, the time frame that a supplemental largemouth bass is available to an angler is probably relatively short, just a few years. Efforts to increase largemouth bass populations would be more effective by trying to create habitat for largemouth bass. The amount and quality of existing largemouth bass habitat in C.J. Strike Reservoir is most likely limiting the largemouth bass population. Supplemental stockings of largemouth bass are not a cost effective method to increase the number of fish captured by anglers.

Deadwood Reservoir

The size of kokanee salmon O. nerka kennerlyi continued to decline in 1992. Lengths of spawning kokanee and gill net sampled kokanee have declined in the last five years (Figure 10). Mean length for the 1992 Deadwood River spawning run was 208.5 mm (Figure 11). The mean length of a random sample of spawning kokanee in South Fork Beaver Creek and Beaver Creek was 205 mm (Figure 12). Mean length of kokanee caught in standardized fall gillnetting (Figure 13) was 196 mm, and also reflected the steady decline in size of kokanee. Counts of spawners (Table 6) indicated that the 1992 spawning run was probably the most numerous since the reservoir was renovated .

Cutthroat trout lengths have been declining in recent years (Figure 14). Cursory visual surveys indicate that westslope cutthroat trout O. clarki lewisi reproduce in the Deadwood River, Trail Creek, Basin Creek, Wild Buck Creek, South Fork Beaver Creek, and Beaver Creek. Reservoir conditions may have had an effect on productivity. Deadwood Reservoir did not fill in 1992, and irrigation withdrawals drew the reservoir elevation down to **a** very low level for a fourth consecutive year. In addition, a special fall release after September 15 took 10,000 acre-feet, leaving approximately 40,000 acre-feet in the reservoir for the winter. This drawdown did not evacuate any significant numbers of fish.

The outlet gates were closed, and no minimum flow was maintained below the dam in the fall and winter of 1992-93. This action should increase the probability of refill for 1993. The Bureau of Reclamation has stated that the removal of a portion of the 50,000 acre-feet minimum pool was a one-time emergency measure for 1992 only (Figure 15). Studies are planned for 1993 to develop a predictive model to estimate impacts of drawdowns on productivity.

Parkcenter Pond

A plan was developed to provide additional water from Logger's Creek to Parkcenter Pond to resolve a summer water quality problem. An artificial wetland was proposed as the outlet for the pond to filter water before return to Logger's Creek. Spacial conflicts with a planned special events facility sponsored by the City of Boise for that proposed wetland area prevented project construction.

Star Lane Ponds

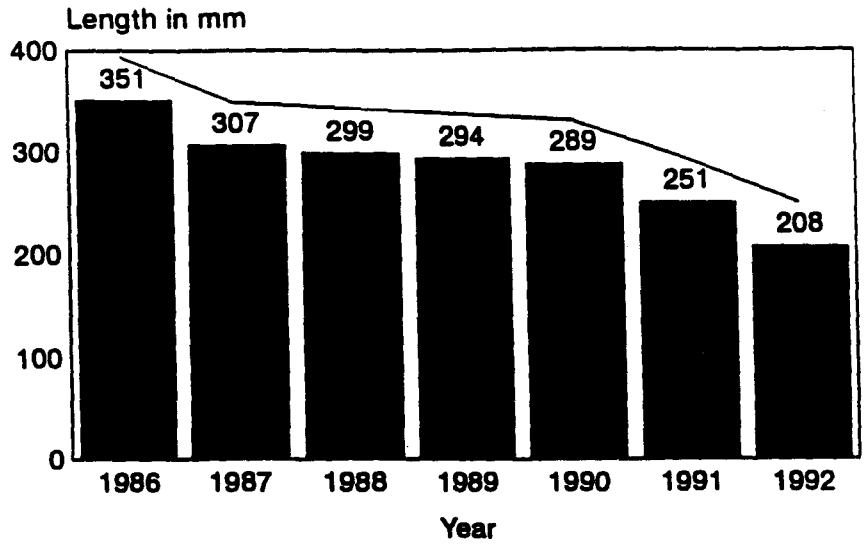
The three Star Lane Ponds were renovated with rotenone in August 1992 to remove common carp Cyprinus carpio and brown bullhead Ameiurus nebulosus. A small number of bass and bluegill were stocked into the ponds in the fall of 1992. Additional warmwater fish stockings will occur in 1993. The final report on the renovation treatment is contained in Appendix 1.

Wilson Springs Ponds

Attempts were made to revegetate the disturbed bank areas surrounding Wilson Springs Ponds in 1992, but the extreme dry conditions prevented most of the grass seed and plant material from establishing. The ponds were stocked and provided a very popular fishery. The IDFG received many compliments for this development throughout the first year of operation.

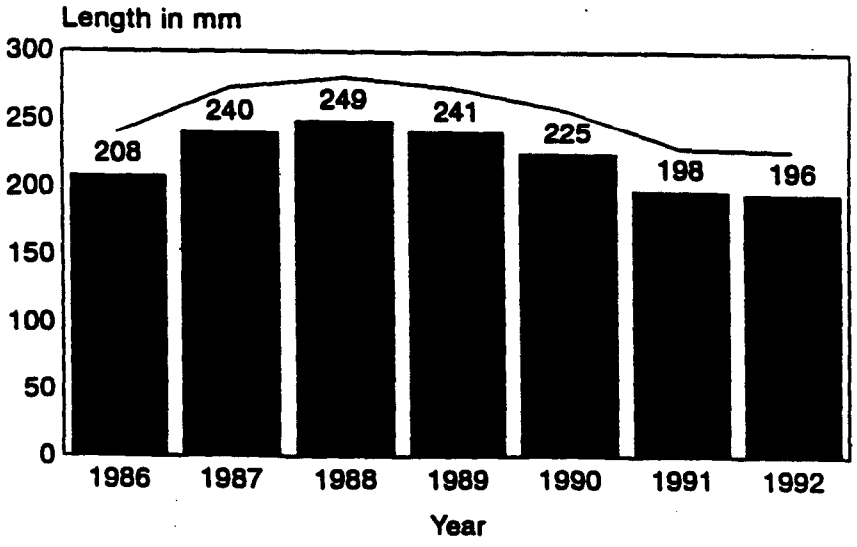
Supplying pumped water to Beach's Pond became very complicated. The Nampa-Meridian Irrigation District objected to the IDFG water right on the basis that

DEADWOOD RIVER KOKANEE
SPAWNER MEAN LENGTHS



Captured between weir and velocity barrier

DEADWOOD RESERVOIR KOKANEE
MEAN LENGTHS



October gill net sampling

Figure 10. Historical length of Deadwood River kokanee spawners and Deadwood Reservoir gill net sampled kokanee.

1992 DEADWOOD RIVER
KOKANEE SPAWNERS

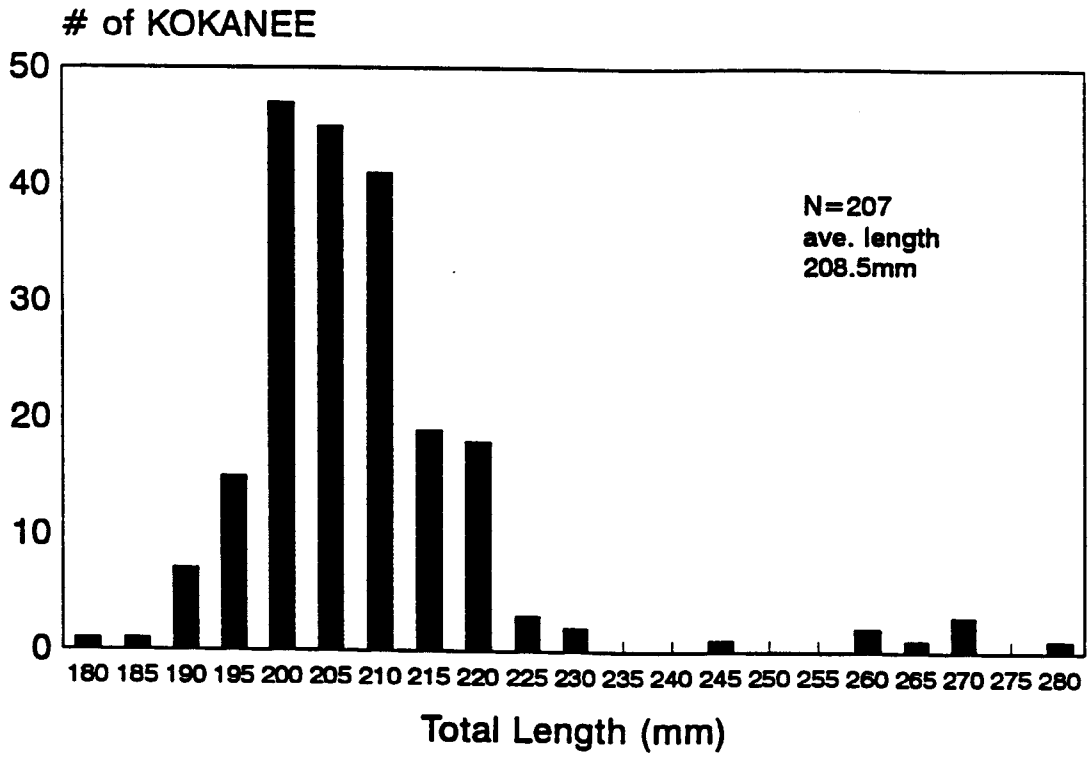


Figure 11. Length frequency of Deadwood River spawning kokanee, captured at the hatchery weir, 1992.

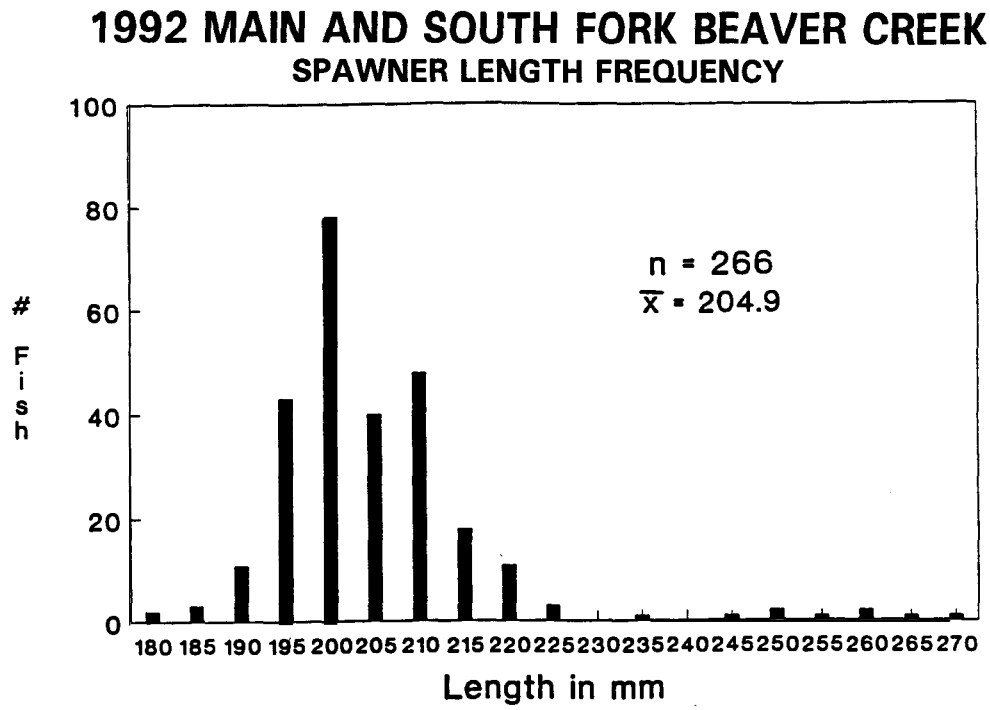


Figure 12. Length frequency of Main and South Fork Beaver Creek spawning kokanee, 1992.

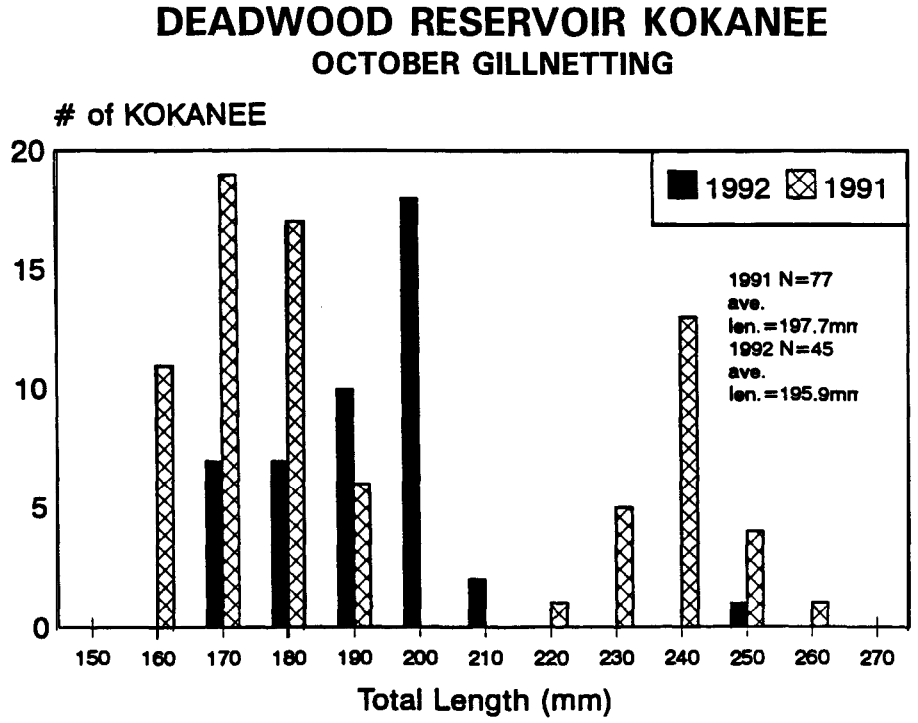


Figure 13. Length frequency of gill net sampled kokanee for Deadwood Reservoir in 1991 and 1992.

Table 6. Deadwood Reservoir tributary kokanee spawning survey 1992.

Tributary	Estimated number	Population control measures	Condition of spawning habitat
Deadwood River (above barrier)	0	Barrier	Good
Deadwood River (Barrier to Basin Creek)	<50	Weir	Fair
Deadwood River (Basin Creek to reservoir)	40,000	Limited Removal	Poor
Wild Buck Creek	100	Weir	Good
Basin Creek	100	Weir	Good
Trail Creek	5,000	Weir/Rotenone	Good
Moulding Creek	0	None	Poor
South Fork Beaver Creek	2,000	Rotenone	Good
Beaver Creek	3,000	Rotenone	Good
North Fork Beaver Creek	0	None	Poor
Habit Creek	<50	None	Poor

DEADWOOD 1987-1992 FALL GILLNET
MEAN CUTTHROAT LENGTHS

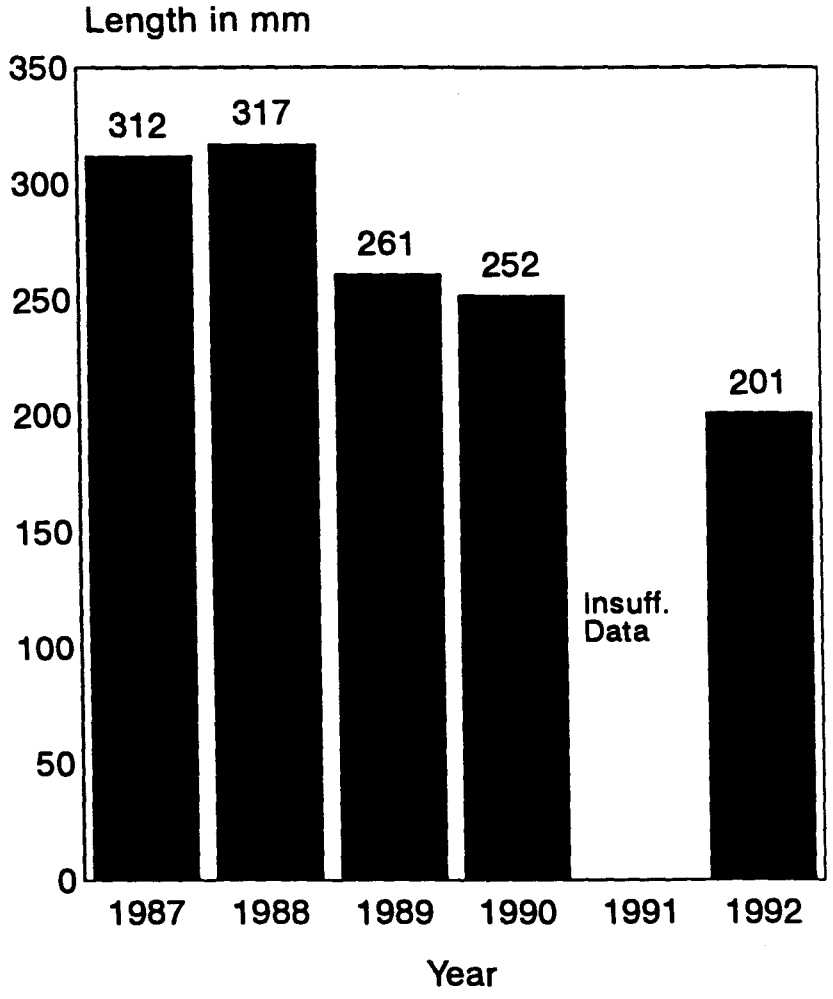


Figure 14. Deadwood Reservoir cutthroat trout mean length trend sampled by gill nets for 1987-1992

Minimum Pool - Deadwood Reservoir

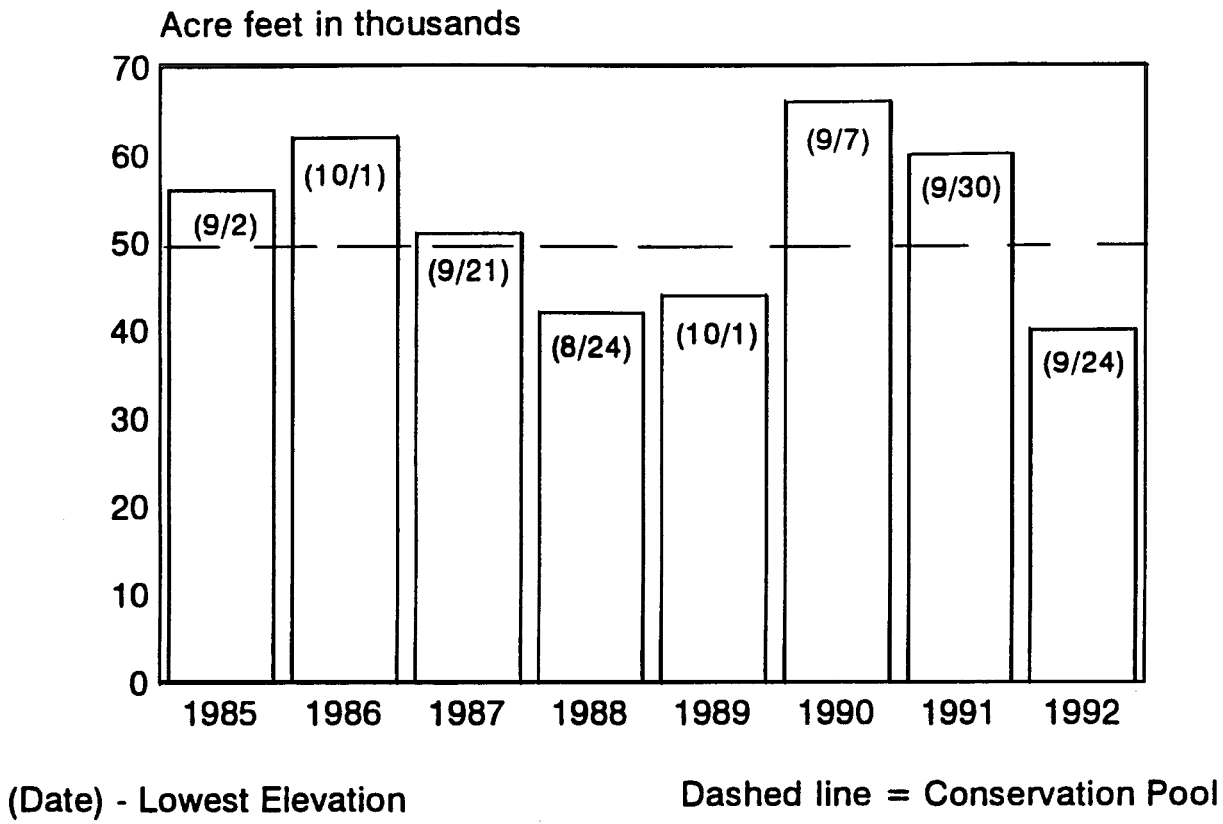


Figure 15. Deadwood Reservoir minimum pool volumes for 1985-1992.

in the future they desired to use all of the artesian water rising from the aquifer and flowing into Wilson Drain for irrigation purposes. After months of meetings and hearings, IDFG acquired the water right to pump from the IDFG well to the pond. The Department of Water Resources conditioned the IDFG water right permit to require that the artesian well be cased and sealed. A casing was driven into place and a 5-horsepower submersible pump was installed that will provide a suitable water supply for Beach's Pond.

Negotiations with Nampa-Meridian Irrigation District regarding a license agreement to install necessary facilities within the Wilson Drain Maintenance Right of Way owned by the Bureau of Reclamation have been unsuccessful and remain a stalemate. This stalemate has prevented the full development of the Wilson Drain fishery. A similar stalemate between the City of Nampa and the irrigation district has stopped the full development of the fishery in the three-mile section of Wilson Drain downstream of Department property. Resolution of this problem will be sought through negotiations with the Bureau of Reclamation.

Crane Falls Lake

Regional management activities for 1992 included quarterly operation of the water evacuation pump, pre- and post-pumping water quality sampling, and fish population sampling. Historically, fishery management activities have attempted to reduce the success of spawning bluegill, pumpkinseed L. gibbosus, and largemouth bass and to improve water quality to sustain conditions to support year-round trout populations.

Water management of Crane Falls Lake changed in 1992. The water pump was operated in February, May, August, and December for seven days at each occurrence. The intent of pump operation was to maintain an acceptable water quality for year-round trout survival. Beginning in the late 1960s, the lake's alkalinity and pH increased inhibiting trout survival. The water pump installation and operation since 1972 has reduced the lake's alkalinity by pumping water out, thus creating percolation from C.J. Strike Reservoir. The high alkalinity values were suspected to be caused by heavy irrigation underground flows from the irrigated highlands above the lake. Alkalinity values in the 1990s were below the levels recorded in the previous decades. The acres of irrigated land above the lake have also been reduced. The quarterly water pumping kept all water quality parameters sampled within limits acceptable to trout (Figure 16, Table 7).

Fish Population

Crane Falls Lake's fish community composition was documented in 1992. Warmwater game fish species comprised 93% of the sample by number, with rainbow trout comprising 7%. The lake survey was conducted and recorded in the lowland lakes standard database format (Appendix 2).

The largemouth bass population is dominated by one year class, with a sample mean of 285 mm total length and mean Wr of 98.2. Total lengths of sampled largemouth bass ranged from 60 mm to 480 mm (Figure 17). The dominant year class was likely caused by extended water pumping operations during the spring spawning period.

Rainbow trout survived over the winter of 1991-92 for the first time in many years. This survival may be due to the mild winter and short period of ice cover, or the change in water management. Water quality sampling during the winter of 1992-93 and spring gillnetting will be used to document trout survival. Rainbow trout mean total lengths ranged from 250 mm to 400 mm, with a mean total

TEMPERATURE AND DISSOLVED OXYGEN PROFILES CRANE FALLS LAKE

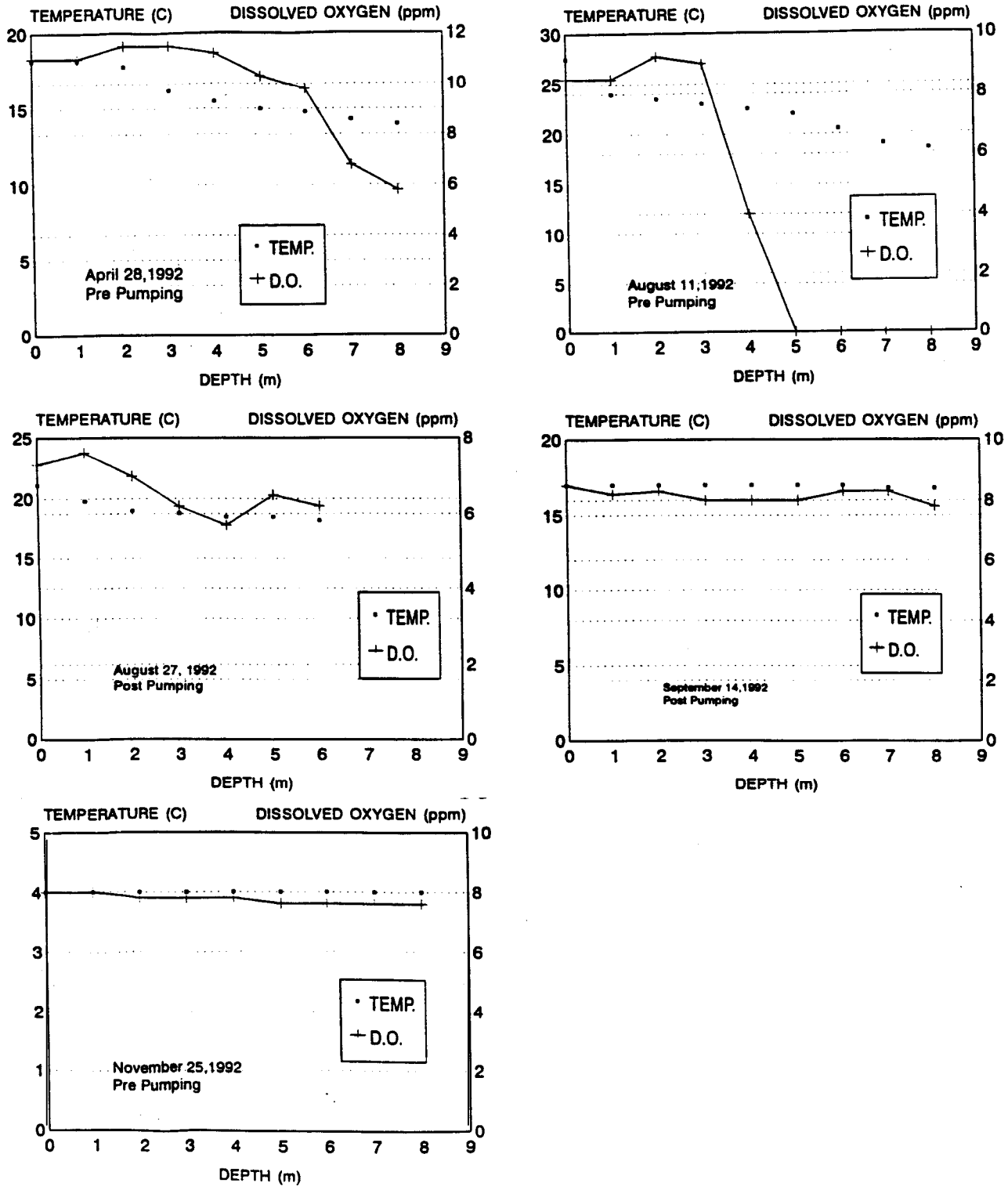
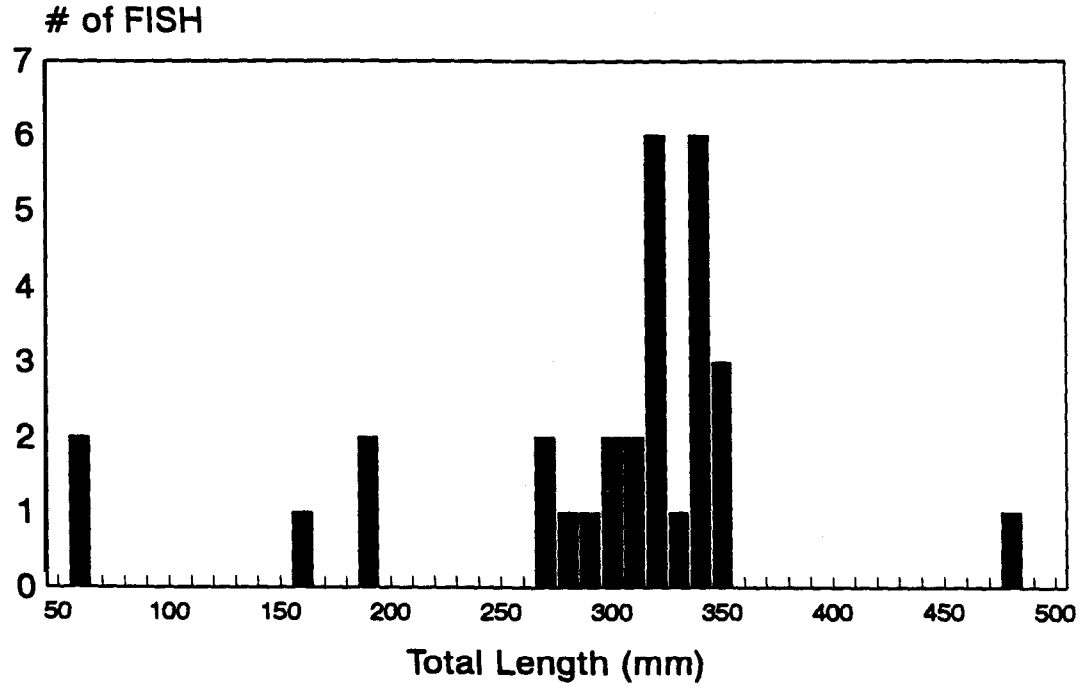


Figure 16. Temperature and dissolved oxygen profiles for Crane Falls Lake, 1992.

Table 7. Crane Falls Lake 1992 water quality monitoring results.

Date	Pumping Pre/Post	Alkalinity mg/l $CaCo_3$	Hardness mg/l $CaCo_3$	pH	Cond Umhos	Secchi Vis.m
4/28	Pre	385	240	8.7	492	N/A
8/11	Pre	385	200	8.5	549	N/A
8/27	Post	385	220	8.5	479	3.0
9/14	Post	385	200	8.5	490	1.5
11/25	Pre	385	200	8.5	522	6.0
12/7	Post	385	200	8.5	459	N/A

CRANE FALLS LAKE
LARGEMOUTH BASS LENGTH FREQUENCY 1992



Electrofishing survey April 28, 1992 N.=30

Figure 17. Largemouth bass length frequency for Crane Falls Lake, 1992.

length of 301 mm for fingerling stocked trout and 310 mm for catchable stocked trout (Figure 18).

Drought Impacted Waters

Lake Lowell

Irrigation withdrawals reduced the lake to minimum pool by August 5 when the irrigation outlet was closed. The lake separated into two pools with a small channel between them. The Lowline Canal trap was operated for three weeks in July; very few adult fish were trapped. A fish salvage of the de-watered Lowline Canal captured less fish than previous years. Approximately 400 channel catfish were removed and transported to eastern Idaho and stocked into the upper Snake River.

The drought and resulting low water conditions in Lake Lowell resulted in a partial fish kill during the winter of 1990-1991. Since then, warmwater fish have been stocked when available. In February 1992, 2,500 largemouth bass, 7,000 bluegill, 5,000 pumpkinseed sunfish, 2,500 crappie, and 1,000 brown bullhead were introduced from a local gravel pit. In June, approximately 500 largemouth bass were removed from Lake Lowell to start fisheries at Wilson Springs and Montour Wildlife Area. In the fall 1992, several hundred largemouth bass were moved back to Lake Lowell from Wilson Springs because Lake Lowell was being filled and overwinter conditions looked favorable. Additional warmwater fish species will be stocked in 1993.

The feasibility of aerating a section of Lake Lowell was investigated because of concerns of possible summer/winter kill caused in part by the extreme low water. Several options were studied; operating agitators with electricity or diesel generators, or a land-based blower/compressor for fine bubble destratification. All methods were rejected because of the high cost. No indication of a summer/winter kill were documented through the end of 1992.

Paddock Reservoir

Irrigation withdrawals reduced the reservoir to a small pool near the dam by late summer. No fishery management activities were conducted in 1992. Warmwater fish species will be added in 1993 if reservoir levels are adequate.

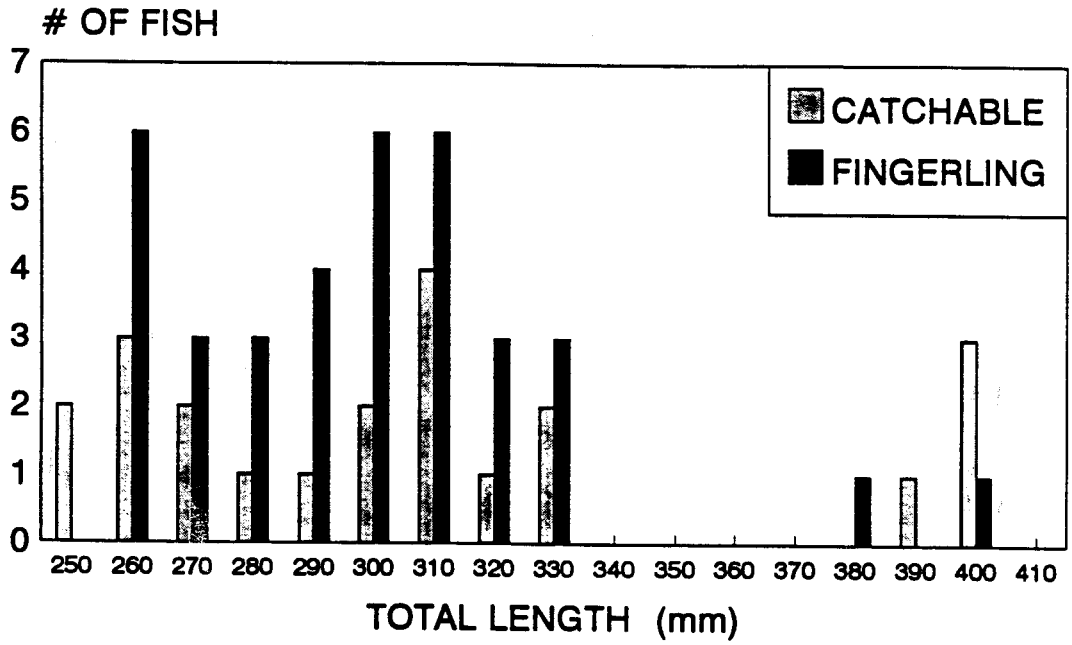
Indian Creek Reservoir

The reservoir was extremely low in 1992 due to the continuing drought. In September 1992, a rotenone renovation project treated the remaining 10 surface acres. The renovation removed stunted crappie, bullheads, bluegill, bass, and catfish. The reservoir will be restocked with warmwater fish species in 1993 if adequate water returns. See Appendix 3 for the final treatment report.

Crane Creek Reservoir

Crane Creek Reservoir and watershed were studied for a possible rotenone renovation to remove common carp from the system. Renovation was scheduled to take place at the end of the irrigation season. Upon analysis of final water volume measurements, the project was postponed because 582 surface acres remained

CRANE FALLS LAKE 1992
CATCHABLE AND FINGERLING
RAINBOW TROUT LENGTH FREQUENCY



2 sinking and 2 floating 150' gillnets

Figure 18. Catchable and fingerling rainbow trout length frequency for Crane Falls Lake, 1992.

at the end of the 1992 irrigation season. Crane Creek Reservoir will be reconsidered for treatment after a low water year.

Arrowrock Reservoir

In 1992, reservoir water levels were low because the reservoir was drained earlier than normal. Little fishing pressure occurred because the boat ramps were out of the water most of the fishing season. The reservoir was stocked, but the trout transferred with the waters spilled into Lucky Peak Reservoir.

Lucky Peak Reservoir

Lucky Peak Reservoir was impacted by large water withdrawals in 1992. By late summer, only one boat ramp was operational. Angling and other recreational uses were considerably lower than normal.

Kokanee trawling was conducted in July with only one juvenile kokanee captured in three trawls. Warmer than normal water temperatures and lower pool elevation contributed to the poor sample.

Spawning kokanee were captured for a disease scan for possible future spawn take operations. On November 13, 1992, two 150-ft gill nets were placed in the mouth of Mores Creek, and two 150-ft gill nets were set approximately one mile downstream from Arrowrock Dam to capture migrating kokanee. Seventy-eight kokanee with an average total length of 358.6 mm (Figure 19) were captured; the majority from the Mores Creek set. Upon testing, no pathogens for Bacterial Kidney Disease (BKD), Infectious Hematopoietic Necrosis Virus (IHN), and Infectious Pancreatic Necrosis Virus (IPN) were detected. No spawn was taken because egg take in northern Idaho was projected to meet all requests.

Fishing Tournaments

Thirty-four organized fishing tournaments were held on Region 3 reservoirs in 1992. C.J. Strike Reservoir had 23, Brownlee Reservoir 7, and Lucky Peak Reservoir had 4 tournaments. Many more tournaments were conducted on Brownlee Reservoir which were regulated by ODFW. Sportsmen complaints have decreased from previous years due to changes in boat ramp usage by bass club tournament contestants.

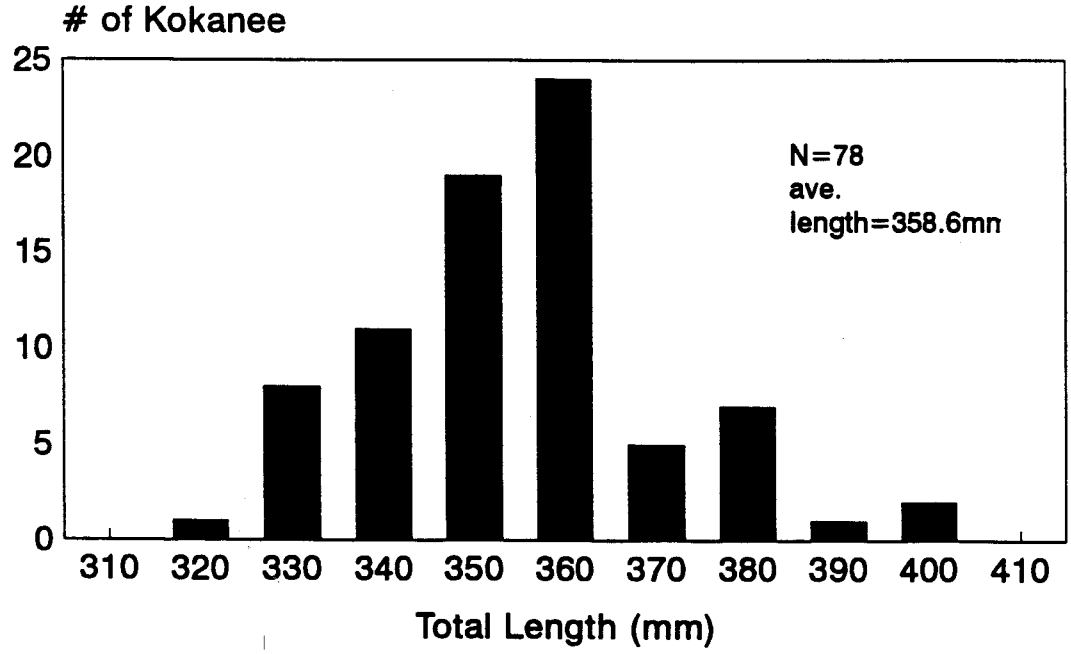
Brochures and Maps

Several brochures highlighting Region 3 were published in 1992. Brochures for C.J. Strike Reservoir, Urban Boise area, and Washington and Payette counties were published.

Spot Creel Checks

Fishery creel checks conducted by regional personnel for 1992 are contained in Appendix 4.

LUCKY PEAK RESERVOIR
KOKANEE LENGTH FREQUENCY 1992



(2) 150' sinking and (2) 150' floating gillnets
Nov. 13,1992

Figure 19. Length frequency for spawning run kokanee captured in Lucky Peak Reservoir.

RECOMMENDATIONS

Monitor largemouth and smallmouth bass populations in lakes and reservoirs to document changes in population structures.

Set gill nets in Crane Falls Lake in the spring of 1993 to document overwinter survival of trout.

Continue to operate the water pump at Crane Falls Lake on a quarterly basis and monitor water quality.

Conduct a recreational use survey on the Wilson Springs Access Area.

Complete the development of Wilson Springs Access Area.

Negotiate with the Bureau of Reclamation for public access along Wilson Drain.

Begin a productivity study of Deadwood Reservoir to assess the effects of water withdrawal on the reservoir system. Closely monitor the kokanee population and restrict their spawning escapement in tributaries as necessary.

Survey two separate mountain lake basins for their fish populations and presence of amphibians, and document the existence of fishless lakes in the basins.

Survey C.J. Strike Reservoir utilizing the lowland lakes survey format.

Stock larger spring rainbow trout fingerlings in C.J. Strike Reservoir; discontinue fall-planted fingerlings.

Investigate enhancement of Claytonia Pond for a recreational fishing pond.

Restock as many drought-impacted lakes and small reservoirs as water conditions allow.

Discontinue cutthroat trout stocking in Deadwood Reservoir.

APPENDIX

Appendix 1. Final report on rotenone renovation of Star Lane Ponds.

State of Idaho
Department of Fish and Game
Region 3
Nampa, Idaho

M E M O R A N D U M September 15, 1992

TO: Steve Huffaker

FROM: Stacy Gebhards

SUBJECT: Final Report on Rotenone Treatment of Star Lane Ponds

On August 19, 1992 Star Lane Ponds were successfully treated with "TIGI" brand 2.5% synergized liquid rotenone. Because of the composition of warm water fish species present in the three small ponds. a 3.0 p.p.m. treatment of rotenone was used. Regional Fishery Biologist Dale Allen was responsible for all aspects of the operation. The Department cooperated with a USFWS training program, and members of the training course did much of the actual treatment of the ponds. The rotenone treatment was conducted to comply with the Division of Environmental Quality short-term activity exemption dated July 14, 1992.

As previously stated, the August 1992 rotenone project was successful in removing large numbers of common carp, black bullhead, bluegill, and pumpkinseed sunfish. A small number of largemouth bass were also killed. The Star Lane Ponds' fish populations were of low recreational value because of large numbers of common carp and very few gamefish.

The ponds were approximately 84° F at treatment and were anoxic below 1.0 meter in the largest pond. The other two ponds were more mixed, but anoxic in the deepest waters. Rotenone was pumped below the thermoclines to facilitate even dispersal of the toxicant. The rotenone acted very quickly under these conditions. Other than a very hot day for the applicators, no problems were encountered during the rotenone application.

SG:DA:er

Appendix 2. Lowland survey report on Crane Falls Lake 1992.

CRANE FALLS LAKE 1992 FISHERY SURVEY REPORT

Crane Falls Lake was naturally created in 1952 by water percolating into a small basin beside the newly impounded C.J. Strike Reservoir. The lake covers 94.2 surface acres with a maximum depth of 26 feet and an average depth of 8.75 feet. There are no inlets or outlets to Crane Falls Lake.

The Idaho Department of Fish and Game (IDFG) successfully managed Crane Falls as a trout fishery in the 1950s and 1960s. In 1968 IDFG identified the increasing alkalinity and pH of the waters causing poor survival of trout. By 1970, water quality became so poor that trout could not survive more than a few minutes. In 1972 a large pump was installed in the lake. Water was pumped out of the lake causing water to percolate back to Crane Falls from C.J. Strike Reservoir. This fresh water recharge reduced the alkalinity levels enough to allow trout survival. Over the next two decades various water pumping measures were tried with varying success on trout survival.

Crane Falls Lake has had a warmwater fishery of largemouth bass Micropterus salmoides, sunfish Lepomis sps., and bullheads Ameiurus sps. for most of the lake's history. Most early management was directed at developing a quality trout fishery which was the preferred choice of the fishermen. In 1977, a fishery renovation with rotenone was done to remove the warmwater fish species. The lake was then managed as trophy trout lake. Warmwater fish species were quickly reintroduced by the public into Crane Falls Lake. Past management of the fishery has generally consisted of stocking rainbow trout Oncorhynchus mykiss catchables and pumping water for about a month per year to control alkalinity.

During 1992 a fishery survey was conducted on Crane Falls Lake to document the fish population structure. Warmwater fish species dominated the fishery by numbers and weight. Largemouth bass M. salmoides, black crappie Pomoxis nigromaculatus, and sunfish Lepomis species comprised 86.3% of the numbers of fish in the sample. Rainbow trout O. mykiss comprised seven percent of the catch. Rainbow trout measured eight to sixteen inches in length and had an average weight of .75 pound. The average length of largemouth bass was 11 inches, the largest individual captured measured 19 inches. The fishery survey documented rather low numbers of bluegills Lepomis macrochirus. This was probably caused by past water management aimed at reducing the bluegill L. macrochirus spawning.

The winter of 1991-92 was one of the few years of late that trout survived over the winter in Crane Falls Lake. Winter water quality is suspected to have caused the poor trout survival. In 1991 and 1992, management changes included quarterly water pumping to circulate water and reduce the alkalinity in hopes of promoting trout survival.

Future management of Crane Falls Lake will be focused on maintaining proper water quality conditions for trout survival and managing a bass/bluegill fishery. Overwinter survival of trout is possible by maintaining lower alkalinity levels. To maintain lower alkalinity levels the water pump will be operated four times per year for one week. Rainbow trout catchables will be stocked in the spring and rainbow trout and Lahonton cutthroat trout Oncorhynchus clarki henshawi fingerlings stocked in the fall. The 20 inch minimum length limit on largemouth bass harvest will remain. This length limit should increase the size and density of predators in the lake. The 20 inch minimum length limit will produce very few harvestable fish, but will provide much catch and release fishing. Water pumping in June will be adjusted so as not to totally disrupt the bluegill or bass spawning success. The reduced bass harvest and thus increased bass densities will have a beneficial effect by increasing the average size of bluegill. The Crane Falls fishery will provide much action for the warmwater fish angler and good trout fishing for the trout anglers. Another fish population survey should be conducted in about five years.

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS
STANDARD DATA BASE

LIMNOLOGICAL CHARACTERISTICS
(To be measured during July 20-Sept. 10 period.
Measurement locations to be indicated on file map.)

LAKE/RESERVOIR NAME: Crane Falls **REGION:** 3 (Nampa)

DATE: 9/14/92 **PERSON COMPLETING FORM:** Dale Allen

MINIMUM DATA SET:

pH: 8.5 (surface) _____ (bottom) Total alkalinity (ppm): 385 (surface) _____ (bottom)

Conductivity (µmhos): 490 (surface)

Secchi (m): 1.5 m (location 1), _____ (location 2), _____ (location 3), _____ (location 4) = _____ (mean)

Temperature and D.O. profile:
(measured at 1-m increments or 10 depth intervals)

Temperature (°C):	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.8	____
D.O. (ppm):	8.5	8.2	8.3	8.0	8.0	8.0	8.3	8.3	7.8	____
Depth (m):	S	1	2	3	4	5	6	7	8	____

Volume of trout habitat (<21°C, >5 ppm D.O.): 100% of volume m^3

Trout habitat as a percent of full pool volume: 100 %

OPTIONAL ADDITIONAL DATA:

Chlorophyll a (µ g/L): _____ Total phosphates (mg/L): _____

T.D.S. (mg/L): _____ Nitrate nitrogen (mg/L): _____

Zooplankton (no/L >____): _____

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS
STANDARD DATA BASE

FISHERIES CHARACTERISTICS

YEAR: 1977 PERIOD SURVEYED: January 1, 1977 to September 10, 1977
EXPANDABLE: ~~NO~~ YES ; FOR PERIOD: _____
HOURS OF EFFORT: TOTAL - 17,776 PER ACRE - 188.7
TOTAL CATCH RATE: 5994 fish 0.34 f/h TOTAL HARVEST RATE: 4346 0.24 fish/hr
HARVEST: NO. PER ACRE - 46.1 POUNDS PER ACRE - _____

SPECIES COMPOSITION (%) OF HARVEST BY NUMBER:

SPECIES:	rainbow	lgmouth bass	bullhead			
%:	69.5	30.0	0.5			
SPECIES:						
%:						

YEAR: _____ PERIOD SURVEYED: _____
EXPANDABLE: NO YES ; FOR PERIOD: _____
HOURS OF EFFORT: TOTAL - _____ PER ACRE - _____
TOTAL CATCH RATE: _____ TOTAL HARVEST RATE: _____
HARVEST: NO. PER ACRE - _____ POUNDS PER ACRE - _____

SPECIES COMPOSITION (%) OF HARVEST BY NUMBER:

SPECIES:						
%:						
SPECIES:						
%:						

YEAR: _____ PERIOD SURVEYED: _____
EXPANDABLE: NO YES ; FOR PERIOD: _____
HOURS OF EFFORT: TOTAL - _____ PER ACRE - _____
TOTAL CATCH RATE: _____ TOTAL HARVEST RATE: _____
HARVEST: NO. PER ACRE - _____ POUNDS PER ACRE - _____

SPECIES COMPOSITION (%) OF HARVEST BY NUMBER:

SPECIES:						
%:						
SPECIES:						
%:						

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS
STANDARD DATA BASE

WATER AREA CHARACTERISTICS

Lake/Reservoir Name: Crane Falls Region: 3 (Nampa)

Date: 09/ 14/ 92 Person Completing Form: Dale Allen

Hydrological Unit: Snake River Catalogue No.: 05-00-00-0175

Type of Water: ___ Natural ___ Man-made XX Impounded Natural

Full Pool: Volume 825 (acre ft.) Area 94.2 (acres)

Elevation _____ (ft.) Maximum Depth 26 (ft.)

Minimum Pool: Volume N/A (acre ft.) Elevation N/A (ft.)

Mean Annual Inflow (or Outflow): no in/outflow (acre ft.)

Trophic Status: __Oligotrophic X Mesotrophic __Eutrophic MEI($\sqrt{(TDS)_{/d}}$):_____

Shoreline Length: _____ (km)

Approximate % Shoreline in:

Urban	Agriculture	Range	Forest	Wetland
		50%		50%

Approximate % Shoreline Ownership:

Federal	State	Private
	100%	

Known Winter Kills?: ___ No XX Yes 1988-1990 trout (years)

Littoral Zone Substrate:

Bedrock	+ Boulder/Rubble	+ Gravel	+ Sand	+ Silt/Mud/Detritus	= 100%
				100	

Littoral Zone Cover: Total 90 %

Large Organic Debris	+ Docks	+ Boulder/Rubble	+ Vegetation	= 100%
	02		98	

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS
STANDARD DATA BASE

FISH COMMUNITY CHARACTERISTICS

LAKE/RESERVOIR NAME: Crane Falls REGION: 3 DATE: 09 / 14 / 92

Catch Per Unit* of Combined Gear Sampling Effort

SPECIES	LENGTH - RANGE(mm)	No.	%	Wt.(kg)	%
lgmouth bass	60 - 480	108.5	25.9		
rainbow trout	250 - 400	29.5	7.0		
bluegill	60 - 320	72.5	17.3		
pumpkinseed sunfish	60 - 200	52.5	12.5		
yellow perch	70 - 200	11.5	2.7		
black crappie	50 - 230	128.0	30.5		
brown bullhead	230 - 370	17.0	4.0		
	-				
	-				
	-				
	-				
GAME FISH SUBTOTAL:		419.5			
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
NON-GAME FISH SUBTOTAL:		419.5			
ALL SPECIES TOTAL:			100%		100%

*one hour electrofishing, one trap net night, and one combined floating and sinking gill net night.

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF:(species) largemouth bass LAKE/RESERVOIR: Crane Falls

DATE: April 28 & September 14, 1992 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349	21	19.3	570				
50-59								350-359	10.5	9.7	685	108			
60-69	7.5	6.9						360-369							
70-79	2	1.8						370-379							
80-89	0.5	0.5						380-389							
90-99								390-399							
100-109								400-409							
110-119	0.5	0.5						410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169	3.5	3.2						460-469							
170-179								470-479							
180-189								480-489	3.5	3.2	2954	169.8			
190-199	7	6.5						490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259	0.5	0.5	216					550-559							
260-269								560-569							
270-279	7	6.5	272	95.7				570-579							
280-289	3.5	3.2	300	96.5				580-589							
290-299	3.5	3.2	320	91.9				590-599							
300-309	7	6.5	390	100.5				600-609							
310-319	7	6.5	415	9 4				610-619							
320-329	20.5	18.9	445	96.2				620-629							
330-339	3.5	3.2		99.6				TOTAL							

TOTAL CATCH PER EFFORT OF: GILL NET 1 set ELECTROFISHING 1HR TRAP NET 1
of sinking & floating

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF:(species) Rainbow trout **LAKE/RESERVOIR:** Crane Falls

DATE: April 28 & September 14, 1992 **PERIOD:**

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389	0.5	1.7	574				
90-99								390-399	0.5	1.7	674				
100-109								400-409	2	6.8	656				
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259	1	3.4	185					550-559							
260-269	4.5	15.2	198					560-569							
270-279	3	10.1	226					570-579							
280-289	2	6.8	216					580-589							
290-299	2.5	8.5	260					590-599							
300-309	4	13.5	285					600-609							
310-319	5	16.9	318					610-619							
320-329	2	6.8	351					620-629							
330-339	2.5	8.5	442					TOTAL		-					

TOTAL CATCH PER EFFORT OF: GILL NET 1 set ELECTROFISHING 1 hour TRAP NET 1

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF:(species) Bluegill LAKE/RESERVOIR: Crane Falls

DATE: April 28 & September 14, 1992 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69	4	5.5						360-369							
70-79	6.5	8.9						370-379							
80-89	16	22						380-389							
90-99	7	9.6						390-399							
100-109	0.5	0.7						400-409							
110-119	1	1.4	21.5					410-419							
120-129	2	2.7						420-429							
130-139								430-439							
140-149								440-449							
150-159	7	9.6						450-459							
160-169	7	9.6						460-469							
170-179								470-479							
180-189	3.5	4.8						480-489							
190-199								490-499							
200-209	7	9.6						500-509							
210-219	3.5	4.8						510-519							
220-229	7	9.6						520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319	0.5	0.7						610-619							
320-329								620-629							
330-339								TOTAL		-					

TOTAL CATCH PER EFFORT OF: GILL NET 1 ELECTROFISHING 1 hour TRAP NET 1

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF:(species) pumpkinseed sunfish **LAKE/RESERVOIR:** Crane Falls

DATE: April 28 & September 14, 1992 **PERIOD:**

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69	5	9.5						360-369							
70-79	12.5	23.8						370-379							
80-89	5	9.5						380-389							
90-99	4	7.6						390-399							
100-109	4	7.6						400-409							
110-119								410-419							
120-129	5.5	10.5						420-429							
130-139								430-439							
140-149								440-449							
150-159	0.5	0.9	99					450-459							
160-169	4	7.6	98					460-469							
170-179	4	7.6	136					470-479							
180-189	1	1.9	159					480-489							
190-199								490-499							
200-209	7	13.3						500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL		-					

TOTAL CATCH PER EFFORT OF: GILL NET 1 ELECTROFISHING 1 hour TRAP NET 1

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF:(species) Yellow perch LAKE/RESERVOIR: Crane Falls

DATE: September 14, 1992 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69								360-369							
70-79	0.5	4.3	3					370-379							
80-89	0.5	4.3	3					380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129	0.5	4.3	16	76.2				420-429							
130-139	0.5	4.3	22	78.6				430-439							
140-149	2	17.4	32	97.9				440-449							
150-159	1.5	13	30	67				450-459							
160-169	1	8.7	43	79.6				460-469							
170-179	0.5	4.3	62	93.9				470-479							
180-189	2.5	21.7	77	98				480-489							
190-199	1	8.7	89	94.6				490-499							
200-209	1	8.7	112	100.9				500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL							

TOTAL CATCH PER EFFORT OF: GILL NET 1 ELECTROFISHING 1 hour TRAP NET 1

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF:(species) Black Crappie **LAKE/RESERVOIR:** Crane Falls

DATE: April 28 & September 14, 1992 **PERIOD:** _____

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59	35	27.2						350-359							
60-69	76	59.1						360-369							
70-79	13	10.1						370-379							
80-89	0.5	0.4						380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209	0.5	0.4	146	121.7				500-509							
210-219	1.5	1.2	167	111.3				510-519							
220-229	1.0	0.8	186	112.7				520-529							
230-239	0.5	0.4	200	104.7				530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL							

TOTAL CATCH PER EFFORT OF: GILL NET 1 ELECTROFISHING 1 hour TRAP NET 1

APPENDIX 2. CONTINUED.

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF:(species) Brown Bullhead **LAKE/RESERVOIR:** Crane Falls

DATE: April 28, & September 14, 1992 **PERIOD:**

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359	0.5	2.9	820				
60-69								360-369							
70-79								370-379	1	5.9	964				
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239	0.5	2.9	218					530-539							
240-249	1.5	8.8	246					540-549							
250-259	1.5	8.8	286					550-559							
260-269	3	17.6	312					560-569							
270-279	4	23.5	365					570-579							
280-289	0.5	2.9	442					580-589							
290-299								590-599							
300-309								600-609							
310-319	0.5	2.9	574					610-619							
320-329	2	11.8	671					620-629							
330-339	2	11.8	701					TOTAL							

TOTAL CATCH PER EFFORT OF: GILL NET 1 ELECTROFISHING 1 hour TRAP NET 1

Appendix 3. Final report on rotenone renovation of Indian Creek Reservoir.

State of Idaho
Department of Fish and Game
Region 3
Nampa, Idaho

M E M O R A N D U M December 3, 1992

TO: Steve Huffaker, Chief, Fisheries Bureau

FROM: Stacy Gebhards, Regional Supervisor # '

SUBJECT: Final Report on Indian Creek Reservoir Fishery Renovation

Indian Creek Reservoir, approximately 12 miles east of Boise, was selected for a fishery renovation because of extreme lack of water and poor condition of the existing warmwater fish population. All permits and public notices were properly administered by Regional fisheries staff. A short-term activity exception was approved by the Division of Environmental quality on July 14, 1992. The access areas to the reservoir were posted in mid-August with public information signs asking for public comment. The reservoir was opened to public salvage on September 10 through 22, 1992. The reservoir was treated with rotenone on September 23, 1992.

The rotenone treatment was successful. The remaining pool was calculated to contain 10 acre feet of water and was treated with 16 gallons of 2.5 percent synergized liquid rotenone. The treatment rate was slightly over 5 ppm of active rotenone. The average depth of the remaining pool was 1.5 feet which caused some difficulty in applying rotenone from a small boat. The fish species identified as killed were: largemouth bass, bluegill, white crappie, channel catfish and brown bullheads.

Indian Creek Reservoir will be restocked with a warmwater fish population in 1993. A possible improvement for tackling rotenone treatments of very shallow, muddy, drawn-down reservoirs would be to utilize aerial spraying from helicopters. The aerial application would be relatively inexpensive and would not disturb the sediments which may well reduce the effectiveness of the rotenone.

Appendix 4. Miscellaneous spot creel data collected by Region 3 personnel at lowland lakes and reservoirs during 1992.

Location of collection	Number of anglers	Hours fished	Hatchery rainbow trout	Wild rainbow trout	Cutthroat trout	Bull trout	Whitefish	Kokanee	Largemouth bass	Smallmouth bass	Bluegill	Crappie	Yellow perch	Bullhead	Channel catfish
Arrowrock Reservoir	86	183.5	12	7	0	5	0	0	0	2	0	0	0	0	0
Black Canyon Reservoir	44	22.0	12	0	0	0	0	0	0	0	0	0	0	0	10
Brownlee Reservoir	206	805.5	0	0	0	0	0	0	0	35	7	263	3	1	291
C.J. Strike Reservoir	[a]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caldwell Ponds	119	177.5	25	0	0	0	0	0	0	4	33	1	0	27	0
Deadwood Reservoir	41	125.0	0	1	22	1	0	206	0	0	0	0	0	3	0
Duff Lake Pond	10	21.0	0	0	0	0	0	0	3	0	2	0	0	3	0
Emmett Airport Pond	14	16.5	0	0	0	0	0	0	2	0	50	0	0	0	0
Horseshoe Bend Pond	56	85.5	23	0	0	0	0	0	0	0	49	0	0	5	0
Indian Creek Reservoir	25	57.5	11	0	0	0	0	0	0	0	0	3	0	0	0
Lake Lowell	82	158.5	6	0	0	0	0	0	0	0	1	0	0	18	7
Marsing Pond	94	167.5	71	0	0	0	0	0	0	0	1	0	0	0	0
Parkcenter Pond	8	12.5	0	0	0	0	0	0	0	0	0	0	0	0	0
Riverside Pond	13	21.5	4	0	0	0	0	0	2	0	0	1	0	0	0
Sawyer's Pond	48	87.5	28	0	0	0	0	0	0	0	6	0	0	0	15
Wilson Ponds	107	162.5	53	0	0	0	0	0	0	0	0	0	0	0	0
Lucky Peak	69	152.5	20	0	0	0	1	11	0	27	0	0	0	0	0
Veterans Pond	25	52.5	30	0	0	0	0	0	1	0	2	0	0	0	0
Star Lane Ponds	9	27.0	14	0	0	0	0	0	0	0	23	0	0	0	0

[a] See report.

JOB PERFORMANCE REPORT

State of: Idaho

Name: Regional Fishery Management Investigations

Project No.: F-71-R-17

Title: Region 3 (Nampa) Rivers and Streams Investigation

Job No.: 3(NA)-c

Period Covered: July 1, 1992 to June 30, 1993

ABSTRACT

Fish population sampling in the Boise River within the City of Boise documented reduced numbers of rainbow trout Oncorhynchus mykiss and mountain whitefish Prosopium williamsoni in three of four sampling stations. Winter releases from Lucky Peak Reservoir were maintained at 80 cubic feet per second (cfs), and trout stockings were discontinued until higher flows begin.

The South Fork Boise River experienced an abnormal flow and higher than normal water temperatures in 1992. A series of recording thermographs were placed in the river to document the thermal water year.

Several new snorkeling stations were established in the upper Middle Fork Payette River to monitor fish population trends and habitat conditions over time.

The lower Snake River had historic low flows in the summer of 1992. Idaho Department Fish and Game regional personnel assisted the Department of Environmental Quality personnel in the collection of water quality samples from Swan Falls to Brownlee Reservoir.

Authors:

Dale B. Allen
Regional Fisheries Biologist

Terry Holubetz
Regional Fisheries Manager

OBJECTIVE

To maintain current information for fishery management decisions on regional rivers and streams.

METHODS

Regional personnel utilized electrofishing and snorkeling methods to gather fishery management information on river and stream fish populations. Habitat measurements were consistent with statewide habitat protocols.

RESULTS

Boise River

Four Boise River electrofishing stations were sampled to compare with 1988 sampling. The Zippin technique, utilizing three passes of the electrode, and the netting team removed all fish species on each pass, and population densities were calculated (Table 1). The three downstream stations population estimates had reduced numbers for the majority of all species from 1988 to 1992. Estimates for natural rainbow trout Oncorhynchus mykiss decreased from 0.67 fish/100 m^2 to 0.02 fish/100 m^2 in the lower Eagle Island section. Mountain whitefish Prosopium williamsoni densities decreased over four times. Station 2 (Les Bois) and Station 3 (Upper Eagle Island) showed similar trends, with reduced fish densities in 1992. Mountain whitefish densities decreased dramatically in the three downstream stations. Mountain whitefish are a sensitive species to environmental degradation. The uppermost station sampled (Municipal Park) had opposite results, with all species increasing in density from 1988 to 1992 (Table 1, Figures 1 and 2).

Increasing urbanization of the City of Boise and six years of drought have impacted the fish habitat and fish community in this stretch of the Boise River. The decreased numbers of fish of all species indicates a general environmental degradation. Observations of the 1992 substrate conditions indicated relatively high accumulations of both organic and inorganic sediment. Low flows in the river have reduced fish habitat by dewatering areas and building up sediments in low velocity rearing habitats.

Trout stocking was suspended in October 1992 due to the low flows through the City of Boise. Glenwood Bridge flows averaged 85 to 110 cubic feet per second (cfs) in the early winter of 1992-93. Lucky Peak Reservoir releases were maintained at 80 cfs through the winter. Trout stocking will resume when flows of 150 cfs or greater are provided.

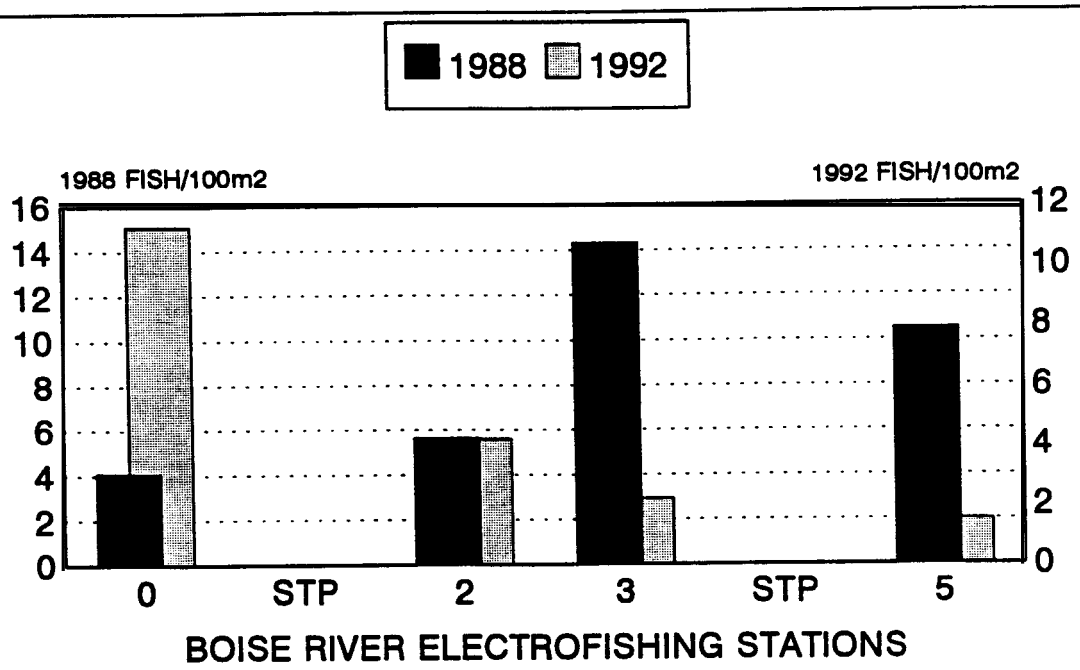
South Fork Boise River

The continuing drought impacted the South Fork Boise River below Anderson Ranch Reservoir. The flow releases from the reservoir were reduced in 1992 due to extreme low water in the reservoir. Temperature of the water released was higher than normal in 1992 due to the reservoir surface elevation falling to the outlet level. Four thermographs were placed into the river to monitor temperatures between mid-April and mid-November 1992. The highest temperature recorded below the dam outlet was 17.5°C on August 8, 1992, at Danskin Bridge 23.0°C on August 20, 1992, and at Neal Bridge 21.0°C on August 8, 1992 (Figures

Table 1. Boise River electrofishing stations in the City of Boise, comparison of 1988 versus 1992.

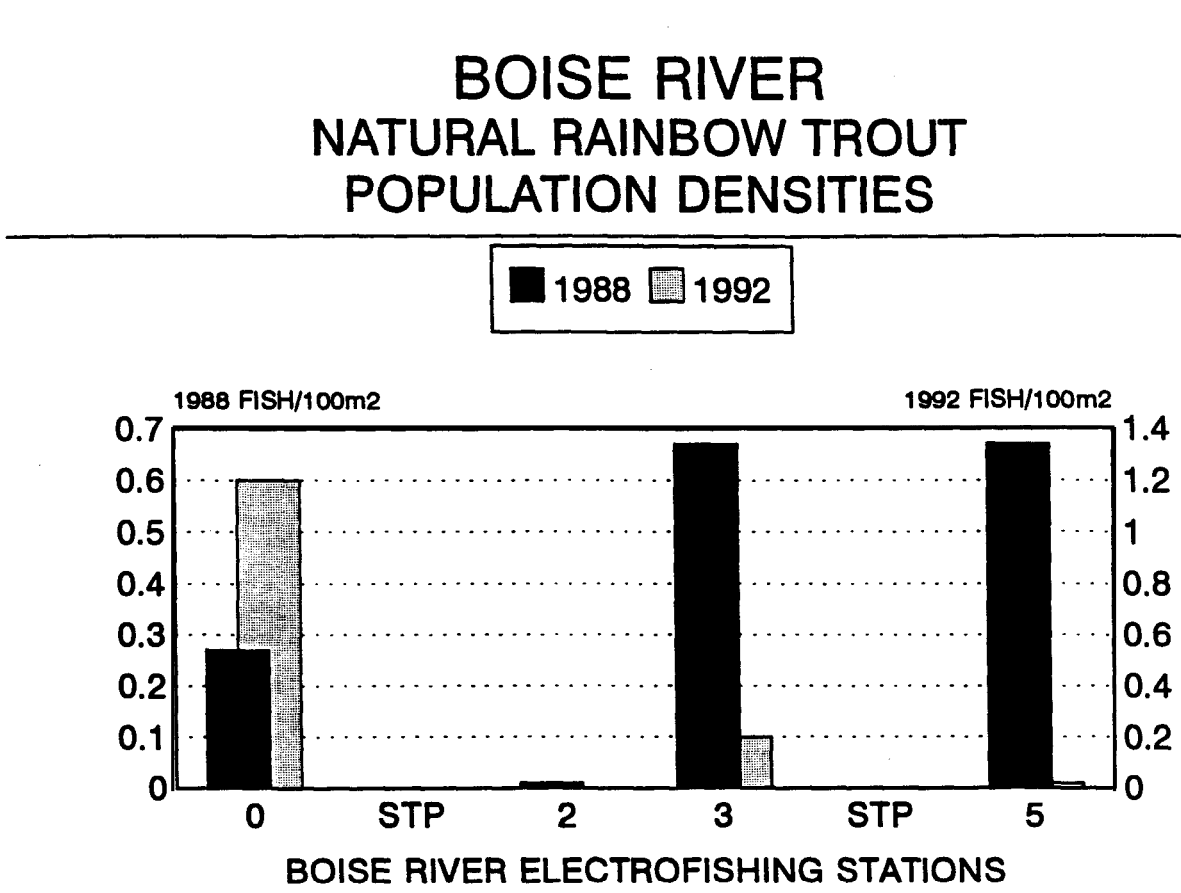
Species Densities	Station Municipal Park Number/100/m^2		Station Number 2 Les Bois Number/100/m^2		Station Number 3 Upper Eagle Island South Number/100/m^2		Station Number 5 Eagle Island	
	1988	1992	1988	1992	1988	1992	1988	1992
Natural rainbow	0.27	1.20	0.01	0.00	0.67	0.20	0.67	0.02
Natural brown	0.08	0.20	0.00	0.00	0.20	0.00	0.12	0.00
Hatchery rainbow	0.11	0.00	0.06	0.02	0.10	0.07	0.87	0.08
Whitefish	4.08	11.30	5.64	4.20	14.32	2.20	10.49	1.50
Largemouth bass	0.00	0.00	0.03	0.00	0.00	0.00	0.07	0.06
Nongame species	0.54	15.90	72.44	23.30	5.93	3.50	19.24	16.60

BOISE RIVER
MOUNTAIN WHITEFISH
POPULATION DENSITIES



STP = Sewer Treatment Plant
Station 0 upstream Station 5 downstream

Figure 1. Population densities of mountain whitefish in the Boise River in the City of Boise, Idaho.



STP = Sewer Treatment Plant
Station 0 upstream Station 5 downstream

Figure 2. Population densities of rainbow trout in the Boise River in the City of Boise, Idaho.

3-6). The canyon below the Danskin Access Area had a cooling effect on water temperature.

Die-offs occurred in the attached algae in 1992, similar to algae kills that had been observed in the past. In 1986, surface releases killed algal growth and reduced aquatic insect production. Some algal kill was noted in August 1992, and by December, the algae had mostly decomposed and was a loose flocculent on the substrate. In past years, the algae remained in good condition all winter. The much reduced algal biomass and the accumulation of sediment will reduce the aquatic insect production until the organic sediment is flushed downstream.

Due to the accumulation of organic sediment in the South Fork Boise River, a large >2,500 cfs spring flushing flow has been requested from the Bureau of Reclamation by the Idaho Department of Fish and Game (IDFG) for 1993.

Middle Fork Boise River

Observations below Atlanta indicated that the sediment load from the 1991 dam failure has slowly transported downstream. Angler comments have been positive about the fishing success and special regulation section in the Middle Fork Boise River. Trout populations will be surveyed in 1993.

Middle Fork Payette River

Several new snorkeling monitoring stations were established in the Middle Fork drainage in 1992. Stations above stocking areas were snorkeled in the Middle Fork Payette to document wild trout densities and habitat (Tables 2 and 3). Three snorkel stations were located in Silver Creek and densities of game fish and habitat recorded (Tables 4 and 5). Low water prevented establishment of snorkel sections above the road end.

South Fork Payette River

Fishing regulations changed for much of the South Fork Payette River in 1992. The majority of the river became "wild trout water" with a two-fish limit. The section from the Deadwood River mouth upstream to Eight-Mile Creek remained under put-and-take trout management. Angler comments were generally negative, or anglers were unaware of the new regulations. A brochure was published about the new regulations and stocking of the Middle and South Forks Payette River drainage.

Two snorkeling stations were repeated by research staff while conducting a population estimate for the upper South Fork (Tables 6 and 7). A description of new snorkel stations established in 1992 is provided in Table 8.

Spot Creel Checks

Miscellaneous spot creel data taken by regional personnel at rivers and streams in Region 3 is included in Appendix 1. Conservation officers were generally not collecting as much creel information as they collected in previous years.

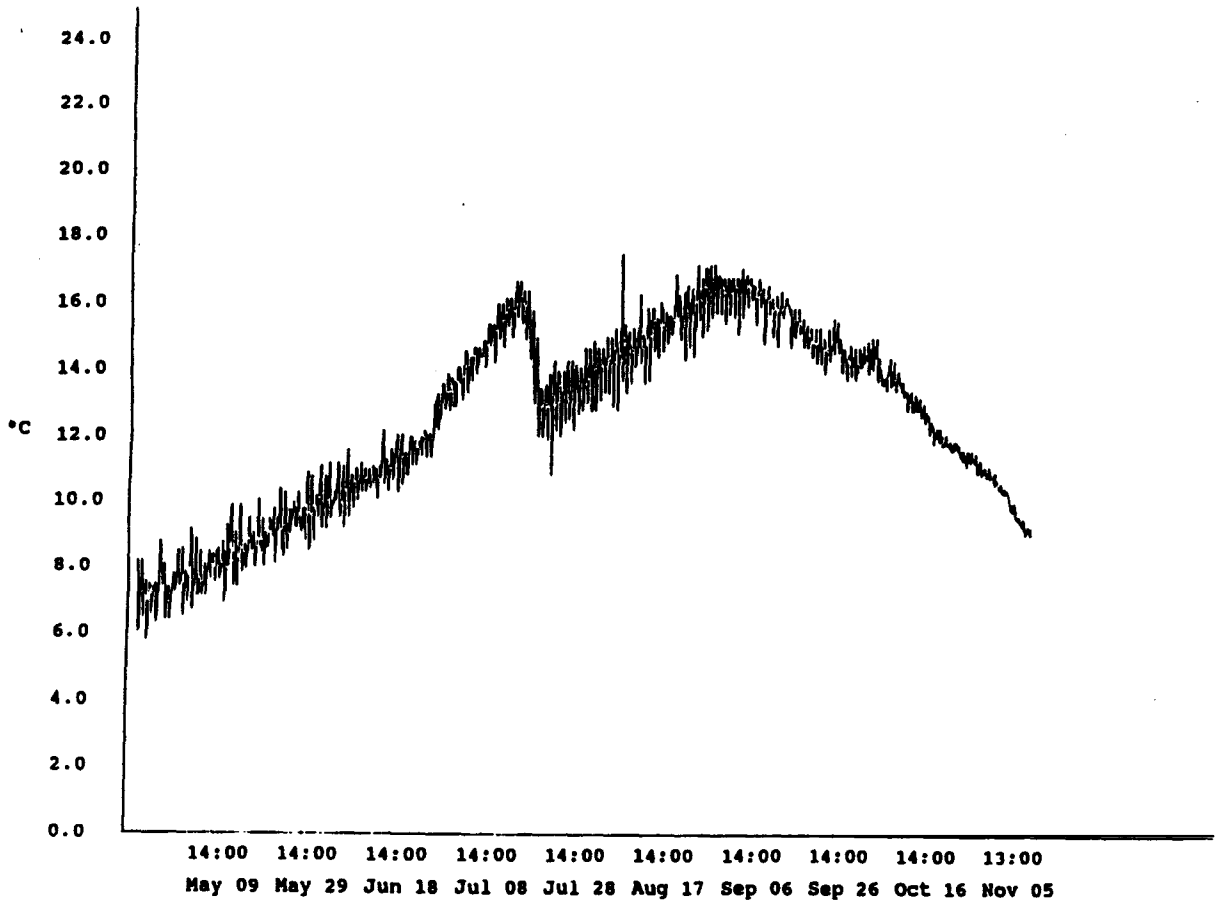


Figure 3. Daily minimum and maximum water temperatures on the South Fork of the Boise River, April 22 to November 9, 1992 directly downstream Anderson Ranch Dam.

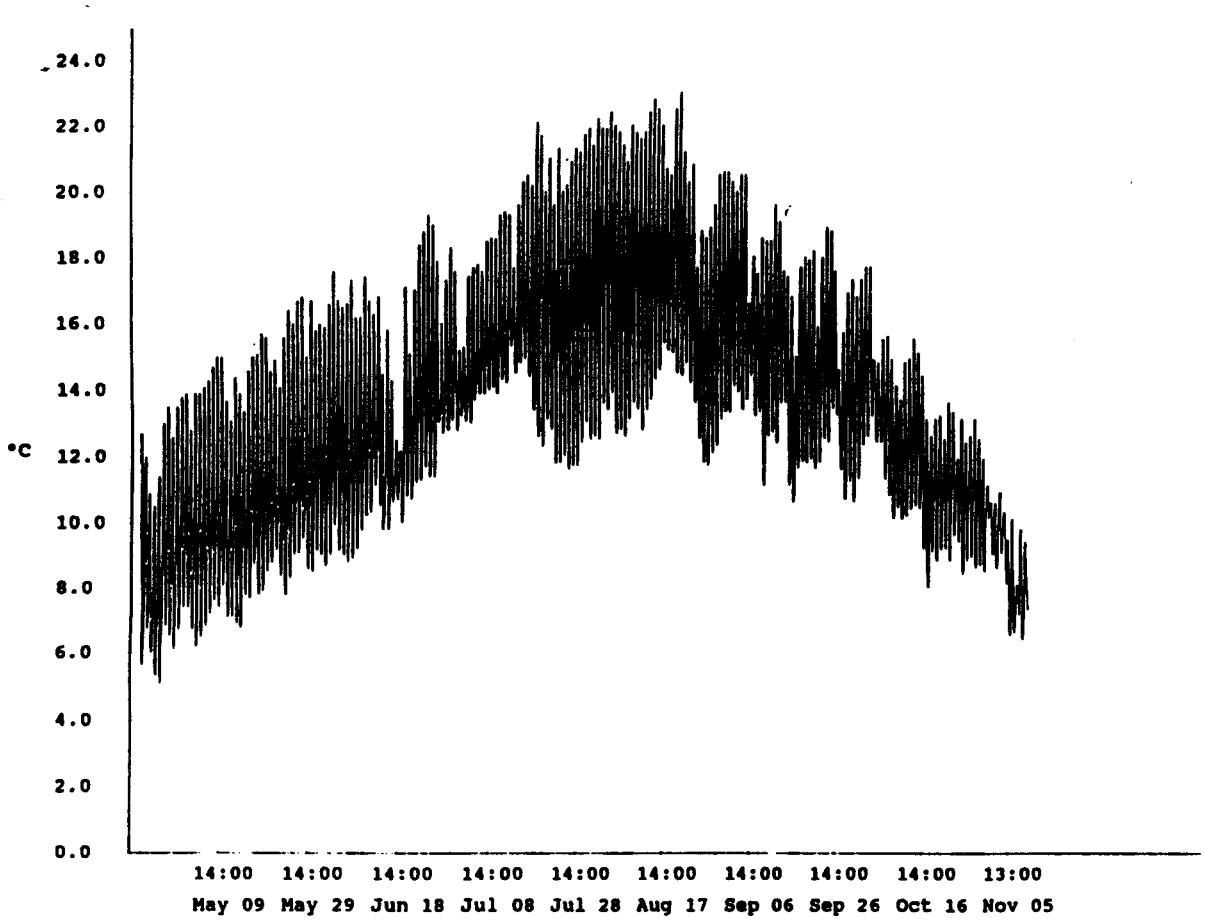


Figure 4. Daily minimum and maximum water temperatures on the South Fork of the Boise River, April 22 to November 9, 1992 at the Danskin Bridge.

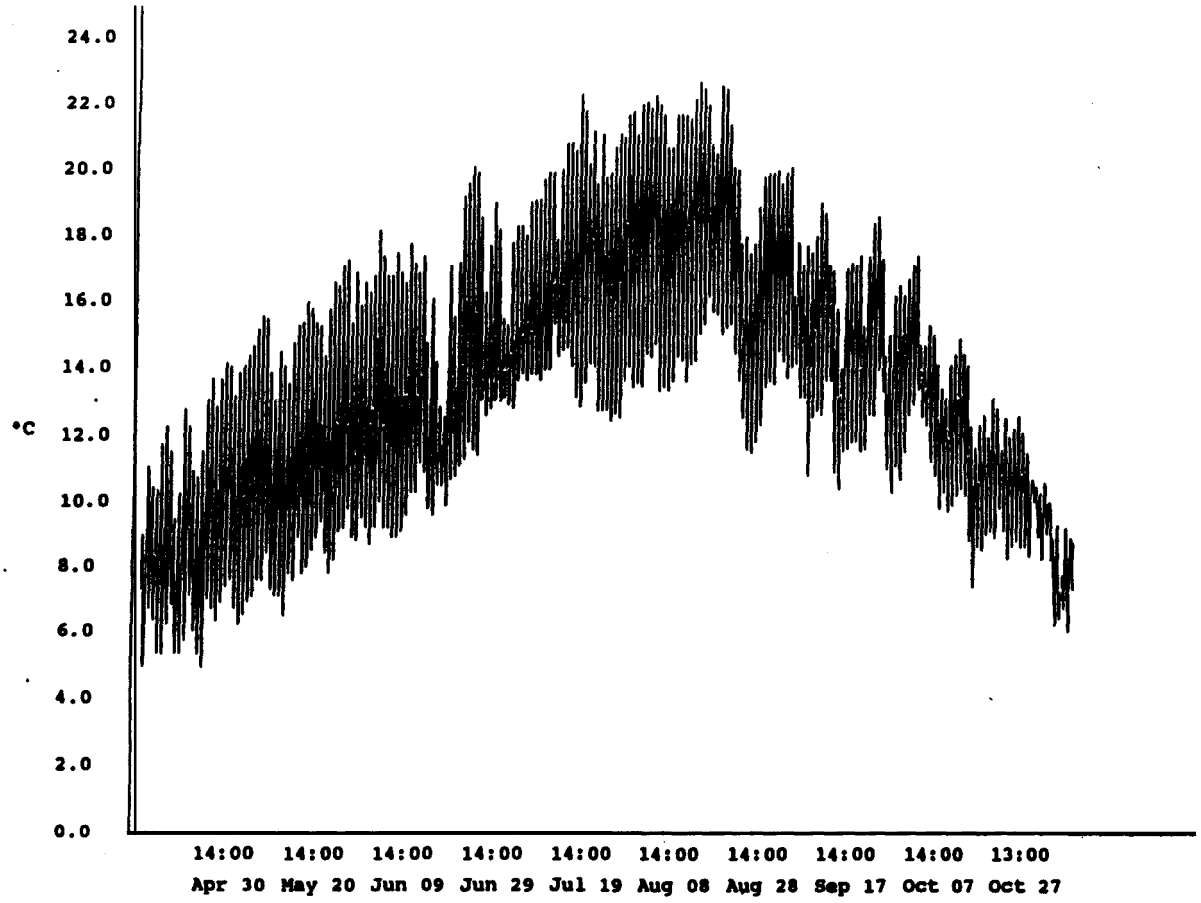


Figure 5. Daily minimum and maximum water temperatures on the South Fork of the Boise River, April 22 to November 9, 1992 at Trail Creek below the Danskin Bridge.

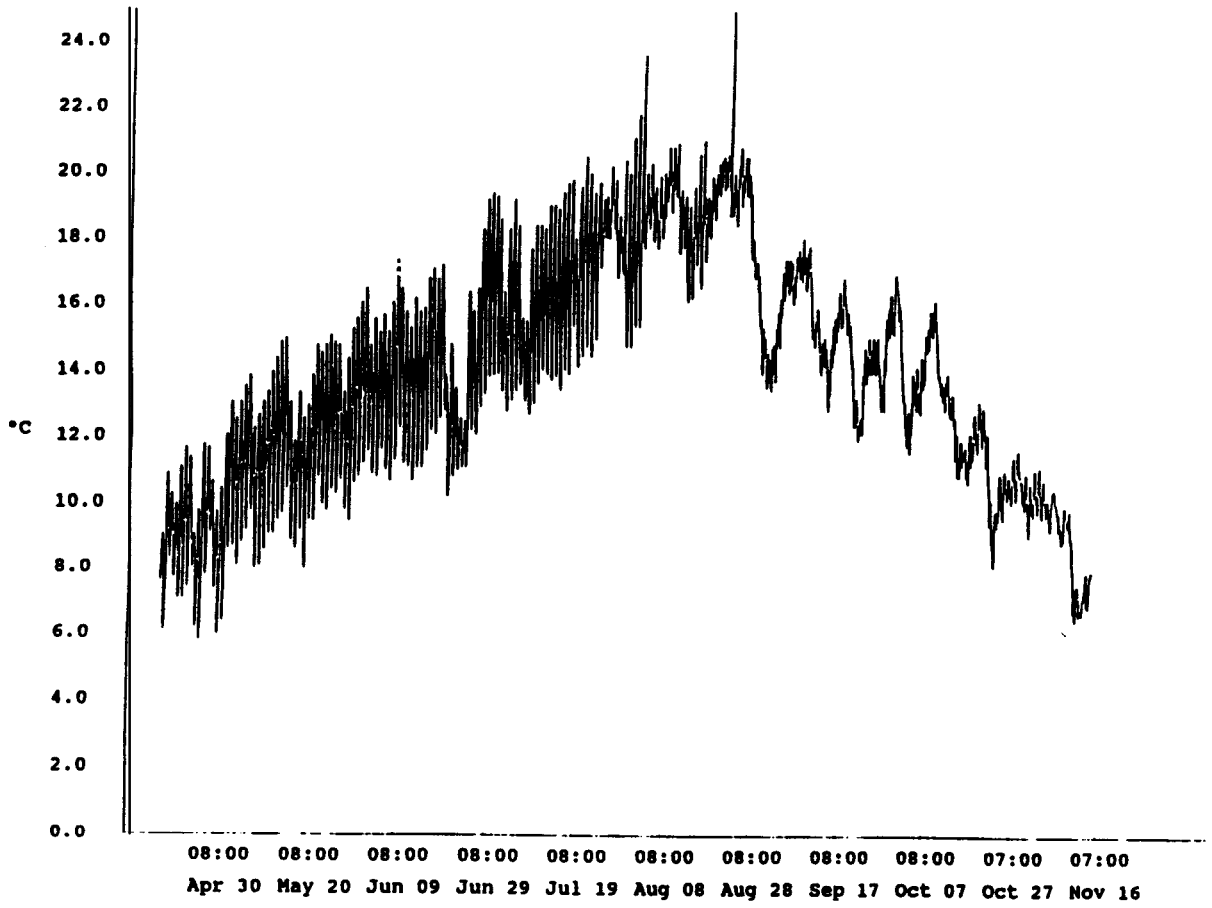


Figure 6. Daily minimum and maximum water temperatures on the South Fork of the Boise River, April 22 to November 9, 1992 at Neal Bridge.

Table 2. Densities of gamefish species observed in snorkeling sections of the upper Middle Fork Payette River by Idaho Department of Fish and Game personnel, July 1992.

Section	Section Area	Wild rainbow trout density (Number/100 m^2) by length (in)				Hatchery Rainbow trout	Total	Mountain whitefish
		0-4 in	5-8 in	9-12 in	>12 in			
8	1168.2	2.31	0.51	0.00	0.0	0.0	2.82	0.0
9	1840.0	1.96	0.33	0.05	0.0	0.0	2.34	0.0
10	939.8	0.74	1.17	0.53	0.0	0.0	2.44	2.5

Section 2. Brook trout density 6.23/100 m^2.
Section 3. Brook trout density 3.99/100 m^2.

Table 3. Summary of physical habitat data collected in sections of upper Middle Fork Payette River in July, 1992 by Idaho Department of Fish and Game personnel.

Section	Channel type	Lenqth (m)	Water temp (C)	Surface Area (m^2)	Mean depth (m)	Percent Substrate				
						Sand	Gravel	Rubble	Boulder	Bedrock
8	B	62.3	25.5°	1,168.0	0.34	40	10	49	1	0
9	B	100.0	19.0°	1,840.0	0.34	47	7	29	0	17
10	B	71.2	22.0	939.8	0.66	29	1	30	7	33

Table 4. Densities of game fish species observed in snorkeling sections of Silver Creek tributary of the Middle Fork Payette River, by Idaho Department of Fish and Game personnel, August 1992.

Section	Section area	Wild rainbow trout density (Number/100 m^2) by length (in)				Hatchery rainbow trout	Total	Mountain whitefish
		0-4 in	5-8 in	9-12 in	>12 in			
1	544.0	11.21	1.65	0.18	0.36	1.47	14.87	0.00
2	481.9	16.60	2.49	0.00	0.00	0.00	19.09	0.00
3	276.0	10.14	3.62	1.09	0.00	0.00	15.94	0.00

Section 2. Brook trout density 6.23/100 m^2.
Section 3. Brook trout density 3.99/100 m^2.

Table 5. Summary of physical habitat data collected in sections of Silver Creek, a tributary of the Middle Fork Payette River, in August 1992 by Idaho Department of Fish and Game personnel.

Section	Channel type	Length (m)	Water temp (C)	Surface area (m2)	Mean depth (m)	Percent Substrate Class				
						Sand	Gravel	Rubble	Boulder	
1	B	80.0	16.0°	544.0	0.42	30	14	34	4	18
2	B	79.0	17.0°	481.9	0.24	33	13	54	0	0
3	B	60.0	15.0°	276.0	0.16	18	8	57	17	0

Table 6. Densities of game fish species observed in snorkeling sections of the South Fork Payette River by Idaho Department of Fish and Game personnel, August 1992.

Section	Section area (m^2)	Wild rainbow trout density (Number/100 m^2) by length (in) 0-4 in	5-8 in	9-12 in	>12 in	Hatchery rainbow trout	Total	Mountain whitefish
1	322.5	4.34	3.72	0.00	0.00	0.00	8.06	1.2
3	1,348.5	1.70	0.82	0.22	0.00	0.15	2.89	2.4

Section 2. Brook trout density 1.24/100 m^2.

Table 7. Summary of physical habitat data collected in sections of the South Fork Payette River in August, 1992 by Idaho Department of Fish and Game personnel.

Section	Channel type	Length (m)	Water temp (C)	Surface area (m2)	Mean depth (m)	Percent Substrate Class Sand	Gravel	Rubble	Boulder	Bedrock
1	B	25.8	15.8°	322.5	1.0	17	9	14	5	55
3	B	87.0	17.9°	1,348.5	1.3	19	14	23	44	0

Table 8. Descriptions of new snorkeling sections created in the upper Middle Fork Payette River drainage in 1992.

Section 8.	Directly below the Boiling Springs Bridge.
Section 9.	Approximately 1/4 mile above the Boiling Springs Guard Station where trail first crosses the river.
Section 10.	Approximately 1/4 mile from gate at Boiling Springs Guard Station. The section is the first high gradiant run that can be seen from the trail. A hot springs is located just above the station.
Section 1.	Silver Creek. Section is downstream of first bridge on Silver Creek on Trail Creek Road. Forest Road 671A runs beside the section.
Section 2.	Silver Creek. Above Silver Creek Guard Station 0.6 miles on Forest Road 671E. Approximately 300 m off road a Jeep trail crosses the stream. Section lies directly downstream of trail.
Section 3.	Silver Creek. At end of Forest Road 671E upstream of bridge. Section starts at bridge.

Snake River

Low flow conditions in the Snake River prompted a water quality investigation by IDFG and the Department of Environmental Quality (DEQ) personnel during late summer. Sixteen stations from Swan Falls to upper Brownlee Reservoir were sampled for temperature, dissolved oxygen, conductivity, pH, chlorophyll a, total phosphorus, ortho-phosphate phosphorus, total nitrogen, ammonia nitrogen, solids, turbidity, and secchi depths. The sampling was discontinued after cooler fall weather began. A modified sampling scheme will be conducted in 1993, again by both agencies.

In general, water quality was poor. The seven years of drought contributed to extreme low flows which concentrated nutrients which led to high algal production. Sampling stations are mapped in Appendix 2. The findings of this joint study are published in Worth and Braun 1993.

RECOMMENDATIONS

Continue Snake River water quality monitoring in coordination with DEQ personnel.

Do complete fish habitat, riparian condition, and fish population surveys in sections of the Owyhee River, Battle Creek, Deep Creek, North Fork Owyhee, South Fork Owyhee, Middle Fork Owyhee, and Blue Creek in cooperation with the Bureau of Land Management.

Do complete fish habitat, riparian condition, and fish population surveys in sections of Squaw Creek, Little Squaw Creek, and Soldier Creek.

Repeat snorkel stations on the Middle Fork Boise River to assess the effect of the regulation change and recovery of the stream from impacts of the Atlanta Dam failure.

Establish electrofishing and habitat monitoring stations on the lower Boise River between Middleton and the Snake River confluence.

Develop a small stream dredge to clean sediment-impacted areas of stream channels. Utilize the dredge on Logger's Creek and Wilson Drain and repeat electrofishing stations.

LITERATURE CITED

Worth, D. and K. Braun. 1993. Water Quality Conditions In The Lower Snake River During Low River Flows. Water Quality Status Report. Idaho Department of Health and Welfare. Division of Environmental Quality.

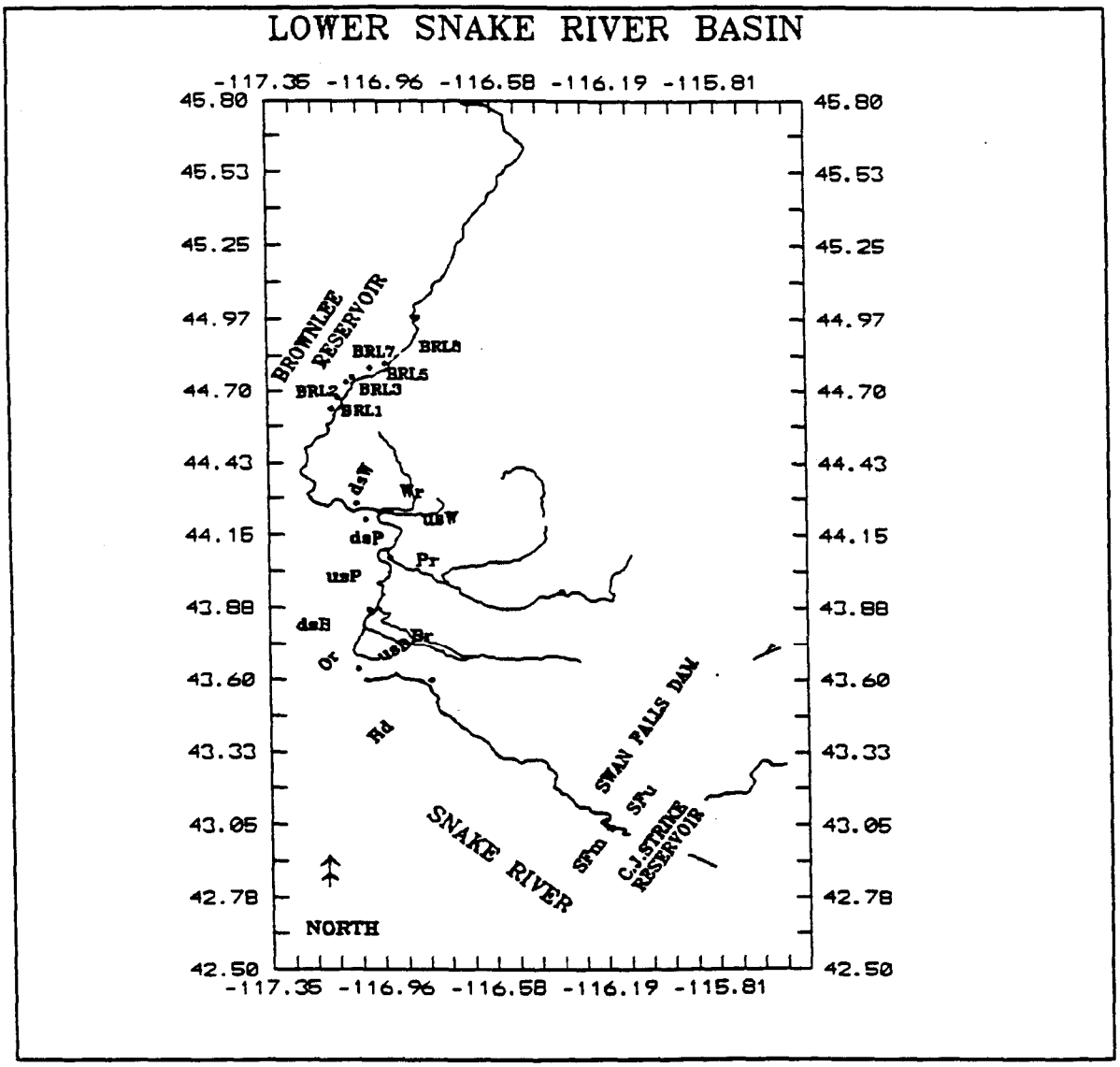
A P P E N D I C E S

Appendix 1. Miscellaneous spot creel data collected by Region 3 personnel at lowland lakes and reservoirs during 1992.

Location of collection	Number of anglers	Hours fished	Hatchery rainbow trout	Wild rainbow trout	Cutthroat trout	Bull trout	Whitefish	Kokanee	Largemouth bass	Smallmouth bass	Bluegill	Crappie	Yellow perch	Bullhead	Channel catfish
Boise River	218	305.0	60	0	0	0	6	0	0	0	10	0	0	4	0
Boise River[a]	17	16.0	5	0	0	0	0	0	0	0	0	0	0	0	0
Flint Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jordan Creek	23	35.5	0	44	0	0	0	0	0	0	0	0	0	0	0
Middle Fork Boise River	49	75.7	37	20	0	1	3	0	0	0	0	0	0	0	0
North Fork Boise River	4	3.0	1	0	0	0	0	0	0	0	0	0	0	0	0
Owyhee River	4	10.0	0	0	0	0	0	0	0	0	0	0	0	0	0
Payette	27	29.5	1	0	0	0	1	0	0	3	0	0	0	0	1
South Fork Payette River	78	79.5	27	53	0	0	0	0	0	0	0	0	0	0	0
North Fork Payette River	51	44.5	0	20	0	0	15	0	0	0	0	0	0	0	0
Middle Fork Payette River	32	33.5	10	0	0	6	1	0	0	0	0	0	0	0	0
Weiser River	7	49.0	0	0	0	0	0	0	0	0	0	0	0	0	3
Deadwood River	4	10.0	0	1	1	0	4	0	0	0	0	0	0	0	0
Smith Creek	9	14.5	0	13	26	0	0	0	0	0	0	0	0	0	0
Snake River	542	1,152.5	0	0	0	0	0	0	1	31	1	5	0	3	311
Snake River[b]	39	100.5	0	0	0	0	0	0	0	22	0	0	0	0	4
Mores Creek	7	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0

[a] Special Regs.
[b] (below Swan Falls)

Appendix 2. Snake River water quality monitoring stations created for long term monitoring in conjunction with the Idaho Department of Health and Welfare.



Worth,D. and K. Braun. 1993. Water Quality Conditions in the Lower Snake River During Low River Flows. Water Quality Status Report. Idaho Dept.of Health and Welfare. Division of Envirnmental Quality.

JOB PERFORMANCE REPORT

State of: Idaho

Name: Regional Fishery Management Investigations

Project No.: F-71-R-17

Title: Region 3 (Nampa) Salmon and Steelhead Investigations

Job No.: 3(NA)-d

Period Covered: July 1, 1992 to June 30, 1993

ABSTRACT

Chinook salmon Oncorhynchus tshawytscha and steelhead O. mykiss spawning escapements remained at very low levels in 1992. Parr densities were well below carrying capacity in both Sulphur Creek and Bear Valley drainages. No significant improvement in riparian vegetation and a continuing degradation trend in streambank conditions occurred in Bear Valley Creek.

Authors:

Dale B. Allen
Regional Fisheries Biologist

Terry Holubetz
Regional Fisheries Manager

OBJECTIVE

Monitor spawning escapements and juvenile production for anadromous streams in Region 3.

RESULTS

Poor habitat conditions are not the controlling factor on adult chinook salmon Oncorhynchus tshawytscha and steelhead O. mykiss abundance. Escapement to near pristine streams such as Sulphur Creek have declined right along with escapement to degraded streams such as Bear Valley Creek. Escapement of spawning salmon and steelhead have remained at low numbers due to downstream migrant passage conditions. However, habitat conditions remain very poor in Bear Valley and Elk creeks and will not improve until more vegetation is sustained in the riparian areas. Grazing management by the U.S. Forest Service will have to be changed to allow streamside vegetation and aquatic habitat to improve. Significant changes in land management practices by the U.S. Forest Service will be required to achieve full recovery of the large production potential of Bear Valley and Elk creeks.

Habitat conditions in Elk and Bear Valley creeks are important to achieve adequate seeding of the large rearing areas in the mainstem Middle Fork Salmon River. Recent redd counts and parr production monitoring reveal that the upper Middle Fork Salmon wild salmon and steelhead populations in both degraded and pristine habitats are at low levels and much below the carrying capacity of these important production streams (Figures 1 and 2).

RECOMMENDATIONS

Continue spawning ground counts and parr density monitoring for both salmon and steelhead in Bear Valley and Sulphur Creek drainages. Assist in monitoring of riparian vegetation and stream habitat conditions and request timely, effective implementation of grazing management plans.

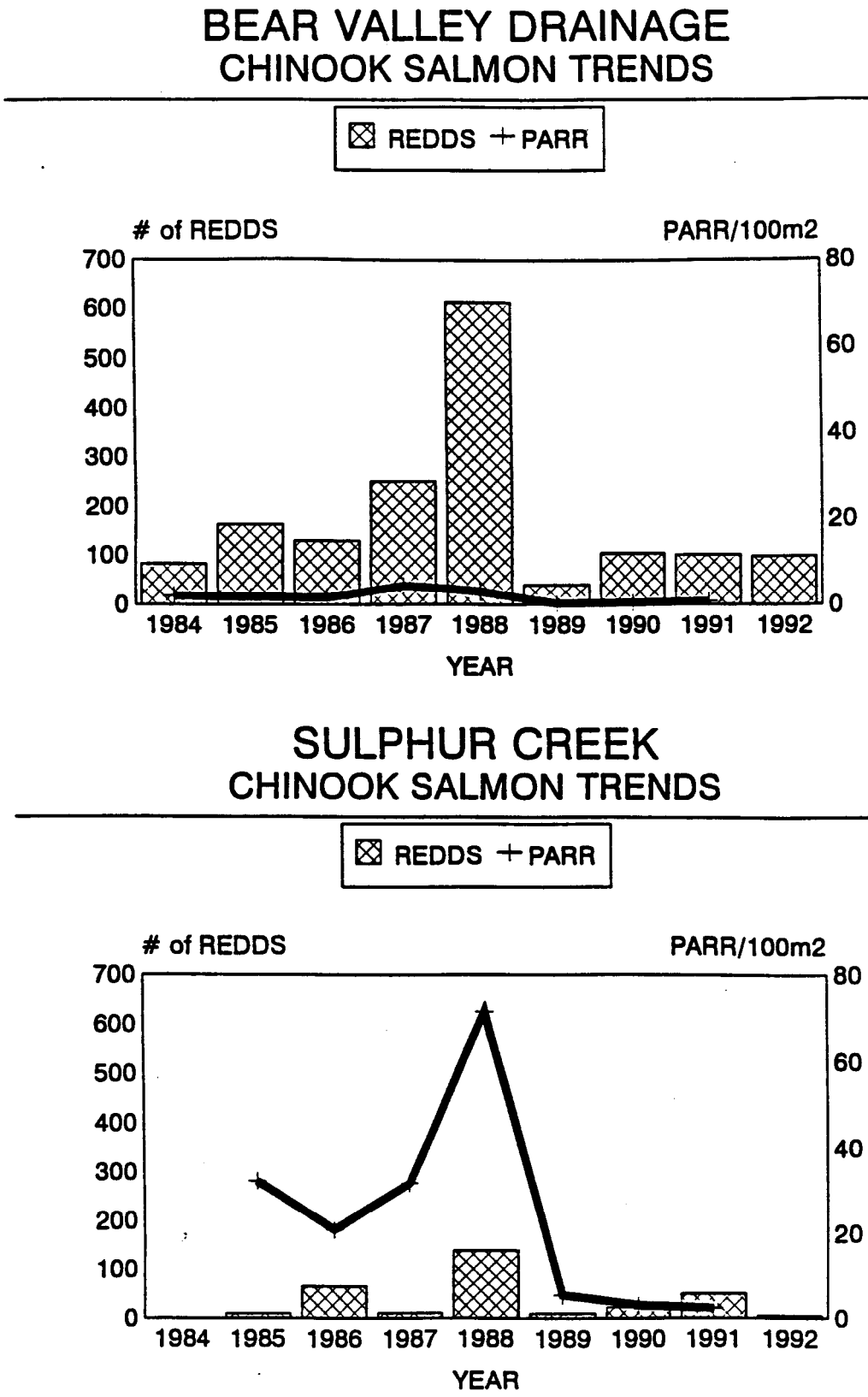


Figure 1. Chinook salmon redd and parr trends for Bear Valley and Sulfur creeks.

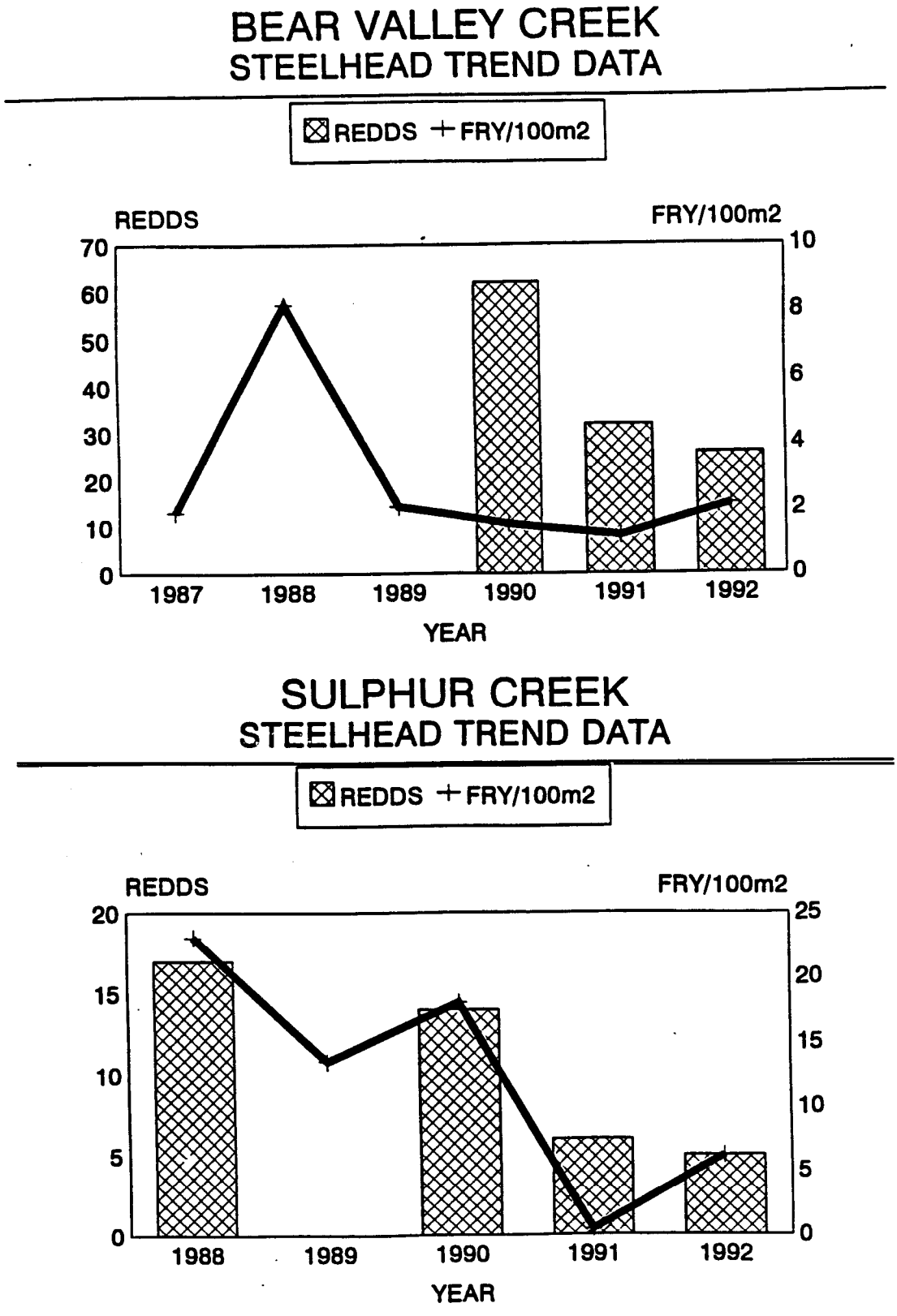


Figure 2. Steelhead redd and parr trends for Bear Valley and Sulfur creeks.

JOB PERFORMANCE REPORT

State of: Idaho

Name: Regional Fishery Management Investigations

Project No.: F-71-R-17

Title: Region 3 (Nampa) Technical Guidance

Job No.: 3(NA)-e

Period Covered: July 1, 1992 to June 30, 1993

ABSTRACT

Most technical requests were directed to the Environmental Staff Biologist for review. The addition of this staff member has freed regional fishery management personnel to do management activities.

Regional fishery management staff assisted 12 landowners with information or on-site visits related to new pond construction.

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